This Prospectus sets forth the intentions of the Institute at the time of its publication with respect to all matters contained therein. The Institute reserves the right to deviate from what appears in the Prospectus and to add, delete, revise or cancel particular courses or programs in order to serve the best interests of the academic community or because of circumstances or occurrences beyond the Institute’s control. The Institute cannot accept responsibility or liability to any person or persons who may suffer loss or who may be otherwise adversely affected by such change.

All tuition and other fees quoted in this Prospectus are subject to change without notice.

The Office of the Registrar will assist students with any questions or problems which might arise concerning the interpretation of academic regulations. It is, however, the responsibility of the students to see that their academic programs meet the Institute’s regulations in all respects.
MISSION
To foster economic development in strategic sectors of the Newfoundland economy, particularly the fisheries and offshore, and to enable Newfoundlanders to participate in the Marine Industry nationally and internationally.

MANDATE
The Mandate of the Marine Institute is to provide education and training, applied research and technology transfer in support of our client industries on a national and international basis. Overall, the Marine Institute is committed to providing a learning environment in which students can reach their full potential. We aim to design and deliver programs that provide graduates with highly competitive skills and abilities. We encourage excellence in teaching and learning, and seek to provide the industrial community with relevant, high quality, applied research and technology transfer.

This mission provides for the development of the Institute as an industrially relevant institution. A range of Master’s Degree, Advanced Diploma, Bachelor’s Degree, Diploma of Technology, Joint Diploma Degree, Post Graduate Certificate, Technician Diploma and Technical Certificate programs are offered, together with a variety of industry-oriented short courses. The Marine Institute’s vision for the future is to be a World Oceans Institute, setting the standard in education, training, innovation, and research. This vision will shape the goals of the Institute, guide its activities, strengthen its expertise, and advance its reputation for ocean excellence globally.
HISTORY
The Fisheries and Marine Institute was established in 1964 as the College of Fisheries, Navigation, Marine Engineering and Electronics. It became affiliated with the University in 1992 and since then has continued to grow as a world-class centre of marine technology and education. The official name is the Fisheries and Marine Institute of Memorial University of Newfoundland, but it is commonly known as the Marine Institute.

The main campus of the Marine Institute overlooks the city of St. John’s from within Pippy Park, which has extensive hiking trails and recreational facilities. This building houses a flume tank, a seafood processing plant, freshwater aquaculture research and development facilities, and extensive marine simulation facilities. The Dr. C.R. Barrett Library, located at this campus, houses one of Canada’s largest marine-related collections. In addition, the Institute manages the Offshore Safety and Survival Centre in Fogo, the Safety and Emergency Response Training (SERT) Centre in Stephenville, a regional fisheries and marine training centre in Lewisporte and a marine base on the south side of St. John’s harbor and another in Holyrood.

The Marine Institute provides a full range of programs focusing on fisheries and marine science and technology. In addition to undergraduate and graduate degrees, the Institute offers advanced diplomas, diplomas of technology, and technical certificates. The Institute also runs a variety of short courses and industrial response programs.

All programs and courses are designed to provide students with the knowledge and skills required for success in the workforce. The Institute seeks the advice of industrial program advisory committees in the ongoing development and review of programs. Whenever appropriate, it submits programs for national accreditation; providing graduates with mobility in professional employment.

PROGRAMS
Programs offered by the Marine Institute provide graduates with the knowledge, skills and experience appropriate for success in the workforce. They fall into three categories, each addressing the particular needs of the industry and the specific goals of the Newfoundland post-secondary education system.

Advanced Diploma, Diploma of Technology and Technician Diploma programs are offered for the new generation of industry professionals, including those entering specific industrial niches requiring highly developed technical skills.

The Institute also offers, in cooperation with faculties of Memorial University, Bachelor’s Degrees in Maritime Studies and Technology which are based upon existing three-year diploma programs, as well as a Master of Marine Studies in Fisheries Resource Management, Master of Technology Management, and Master of Maritime Management. The Marine Institute also participates in the administration and delivery of the Master of Science in Aquaculture.

Technical Certificate programs are offered for persons entering the workforce at the basic production or technical levels. Industry response and short course professional development programs are offered to industry participants who wish to continue their professional development.

Professional development and certification in marine navigation, safety survival and firefighting are offered through a wide selection of training courses provided by the School of Maritime Studies. School of Fisheries short courses are offered within rural communities in harvesting, processing, safety and fisheries management.

ACCREDITATION
Program standards and industrial relevance, are validated through accreditation, where appropriate, with the Canadian Technology Accreditation Board or through certification by regulatory agencies such as Transport Canada.

Our industrial clients and partners are central to all of our program development activities. The advice of our industrial program advisory committees is sought in the ongoing development of longer programs, while short courses are designed to meet specific industry needs. Whenever appropriate, programs are submitted for national accreditation, providing graduates with mobility in professional employment.

SCHOOLS
Instructional and Industrial Response and Development activities at the Marine Institute are organized around three schools, the School of Fisheries, the School of Maritime Studies and the School of Ocean Technology and supported by the Division of Academic and Student Affairs. Theory and practice are viewed as partners in the learning process, as classroom education is continually translated into practice. Instructors are both educators and practitioners, and the student’s educational experience is based upon a balanced combination of practical and theoretical knowledge. The Institute also has a strong capability in learning technology and distance education.

The role of each of the three schools, as well as the programs and services offered is described in general below. Further information regarding our programs is provided in the detailed program descriptions which follow in this calendar. Further information about our industry response and development services is available by contacting the Schools or Marine Institute Information Services.

SCHOOL OF FISHERIES
The School of Fisheries is responsible for developing and delivering education, training, and industry development services required to meet the needs of the harvesting, processing and aquaculture sectors of the seafood industry, and of the food industry in general. The School’s resources are committed to developing and delivering education and training programs to meet the needs of these sectors. The School’s education and training programs range from full-time programs offered at the Marine Institute’s facilities on Ridge Road to a comprehensive suite of short, industry-response courses which are community-based and offered in response to specific industry and group requests.
Increasingly, the School of Fisheries is moving to more on-line programs, particularly in its graduate programming (i.e. masters and post graduate certificates).

The programs offered by the School of Fisheries are as follows:

- Master of Marine Studies (Fisheries Resources Management)
- Master of Technology Management (Aquaculture Technology Option)
- Post Graduate Certificate in Food Safety
- Post Graduate Certificate in Quality Management
- Advanced Diploma in Sustainable Aquaculture
- Advanced Diploma in Integrated Coastal and Ocean Management
- Advanced Diploma in Food Safety
- Advanced Diploma in Water Quality
- Joint Diploma of Technology/Bachelor of Technology in Food Technology
- Technology Diploma in Marine Environmental Technology
- Technical Certificate in Aquaculture (Salmonid; Mussel)
- Technical Certificate in Harvesting

The School of Fisheries also offers a variety of industry response courses in Processing, Harvesting, and Aquaculture. These are normally offered on a contractual basis in partnership with industry clients.

Community Based Education Delivery (CBED)

The Marine Institute has a history of delivering education and training programs in communities across Newfoundland and Labrador and in other areas of Canada. Since 1964, community based training has been a part of the Marine Institute. The Community Based Education Delivery Unit (CBED) continues this tradition, offering industrial response training. The unit’s main office is located in St. John’s with regional offices located in Lewisporte and Iqaluit, Nunavut.

In collaboration with industry and government CBED supports key training priorities by organizing, facilitating, and leading training in these areas:

- Aquaculture
- Environmental
- Fish Harvesting
- Food Processing

To respond to industry and community needs:

- CBED has a selection of courses developed and ready to deliver that meet standards set by Transport Canada, the Canadian Food Inspection Agency, and various international regulators.
- Through the School of Fisheries, under which CBED operates, online courses related to fish harvesting and food processing are available for clients who may want to complete training from any location.
- Customized short courses can be developed by CBED to meet the needs of developing countries.
- CBED can design training to meet your specific needs and deliver the program in your community.

Center for Sustainable Aquatic Resources

The Centre for Sustainable Aquatic Resources, was established in 1988 to promote the sustainable development of aquatic resources through collaborative industrial research and development, technology transfer and education services to the global fishing industry. Working collaboratively with industry, government and academia on a local, national and international level, the Centre:

- Promotes the sustainable development of aquatic resources and protects our freshwater environments.
- Proactively pursues client oriented research and technology transfer projects through strategic partnerships
- Addresses the specific needs of harvesters and fishing gear manufacturers, by undertaking industrial research and development, technology transfer, education and information services in support of the fishing industry, on a general basis or through contract or joint ventures.

The Centre’s facilities include the world’s largest flume tank - the aquaculture equivalent of a wind tunnel, underwater remote sensing equipment, underwater camera services, hydrostatic pressure testing, and a core staff of fisheries researchers with local, national and international experience in fishing gear design, fisheries sustainability and responsible harvesting and energy efficient fisheries. The Centre offers research opportunities to graduate students at Memorial University.

Center for Aquaculture and Seafood Development

The Centre for Aquaculture and Seafood Development (CASD) has a solid history of building successful partnerships with other ocean research organizations and the Ocean Sciences Centre, the Centre for Cold Ocean Resources, The National Research Council, the Institute for Marine Bio-Sciences, the Coastal Zone Research Institute; and other provincial, national and international aquaculture and seafood processing enterprises.

The CASD’s team of scientific and technical researchers combines qualifications with multi-disciplinary industrial skills to provide assistance to clients in all areas of aquaculture and food development ranging from site evaluation services; to food processing technology design, processing automation, and testing; food product development; fish health and nutrition; and marine biotechnology. The CASD offers industrial applied research, technology transfer and consulting services to its clients.

Center for Fisheries Ecosystems Research

The Centre for Fisheries Ecosystems Research (CFER) was established in 2003 as part of the Marine Institute, as per the Centre for Marine Technology (CMT) 2010. The Centre’s goal is to perform fisheries research that will gain better understanding of fish stocks and productivity in Newfoundland and Labrador’s marine ecosystems. This, in turn, will enable the province to assist in federal and international fisheries management.

Specifically, CFER’s mandate is to:
- focus research on Newfoundland and Labrador fisheries and the sustainability of stocks and their fisheries
- offer research and training opportunities to graduate students both locally and internationally
- collaborate with the Department of Fisheries and Aquaculture and Fisheries and Oceans Canada for research activities and fisheries management
- collaborate with other researchers and institutions within Canada and worldwide

SCHOOL OF MARITIME STUDIES

The School of Maritime Studies is responsible for education and training programs to prepare Newfoundlanders and Labradorians for careers in the marine transportation industry. Current programming is focused on preparing deck and engineering officers for vessel operations and preparing professionals for the associated marine technology sectors.

Programs currently offered by the School of Maritime Studies include:
- Master of Maritime Management
- Bachelor of Maritime Studies
- Diploma of Technology in Marine Engineering Systems Design
- Diploma of Technology in Marine Engineering Technology
- Diploma of Technology in Naval Architecture
- Diploma of Technology in Nautical Science
- Technical Certificate in Marine Diesel Mechanics
- Technical Certificate in Bridge Watch Program

A number of programs offered by the Marine Institute involve compulsory work placement. Services to support student employment are offered through the Marine Institute’s Office of Career Integrated Learning.

Industry response and development services of the School of Maritime Studies are offered through the Centre for Marine Simulation.

Centre for Marine Simulation

The Centre for Marine Simulation (CMS) trains marine personnel to meet routine and emergency situations through simulator training and is also involved in the development of new vessel management techniques and in marine industry research. Research areas include: equipment testing, testing of operators, crew familiarization, and the development and testing of operational procedures. The CMS facilities include: a full mission ship’s bridge simulator, a ballast control room simulator, a marine engine/control room simulator, an electronic navigation simulator, a dynamic positioning simulator, a tug simulator and a global maritime distress system simulator. The facilities are also used for research into marine safety, behavioral research and port development studies. In conjunction with industry, the Centre develops joint programs and seminars to disseminate information about operational innovations and new technologies.

THE SCHOOL OF OCEAN TECHNOLOGY

The School of Ocean Technology (SOT) develops and delivers education, training and applied research and development programs in various aspects of technology as it is used by primary ocean industries. The School’s resources are committed to developing and delivering education and training programs to meet the needs of the ocean sector in Newfoundland and Labrador, and beyond.

The Programs offered by the School of Ocean Technology are as follows:

- Master of Technology Management
- Bachelor of Technology
- Joint Diploma of Technology/Bachelor of Technology in Underwater Vehicles
- Joint Diploma of Technology/Bachelor of Technology in Ocean Mapping
- Technician Diploma in Remotely Operated Vehicles

Centre for Applied Ocean Technology (COTec)

The Centre for Applied Ocean Technology (COTec), located at the Holyrod Marine Base, is the applied research arm of the School of Ocean Technology. Its primary goals are to:
- Undertake pre-commercial, applied research and development in response to the needs of the key ocean industries identified in the Marine Institute’s Vision 20/20 plan.
- Where possible and practical, work collaboratively with the ocean technology community in Newfoundland and Labrador
- Provide work experience and employment opportunities for students and graduates of SOT programs.

Activities within COTec are primarily focused in four key areas - ocean mapping, ocean observation, ocean instrumentation and underwater intervention.

Ocean Safety

Offshore Safety and Survival Centre (OSSC) undertakes training and research to improve marine safety standards. Instruction and practical training for client groups are provided at the Marine Institute’s Southside Marine Base, located on the south side of St. John’s harbour, and at a purpose-built training Centre located in Fogo, approximately 30 km from St. John’s and the Holyrod Marine Base.

Staffed by qualified Transport Canada approved faculty, training in safety, survival and emergency response is provided through laboratory demonstrations, classroom instruction and practical hands-on simulated emergency exercises. The OSSC is actively involved in research aimed at improvements to marine and offshore safety.

Training courses offered by the OSSC are accredited by Transport Canada; Canada-Newfoundland and Labrador Offshore Petroleum Board (CNLOPB); Canada Nova Scotia Offshore Petroleum Board (CNSOPB); Petroleum Industry Training Service; National Fire Protection Association (NFPA); International Fire Service Training Association (IFSTA) and St. John Ambulance.
The Office of Student Recruitment
variety of student support services. In addition, the OSSC has the capability to customize courses in its areas of specialty to meet specific client needs.

Safety and Emergency Response Training (SERT) Centre
The Safety and Emergency Response Training (SERT) Centre is located in Stephenville on the west coast of Newfoundland. It was established to respond to the need in Atlantic Canada for a facility to train air crash firefighters and it was enhanced to include the municipal fire-fighting training program. The SERT Centre offers training courses in aviation, marine and industrial safety, and emergency response, in order to service the training needs of industries and individuals in Atlantic Canada.

FACILITIES

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The Marine Institute’s main campus is located in St. John’s, within Pippy Park. It consists of classrooms and technical laboratories in support of its Programs, a flume tank, licensed seafood processing plant, simulation facilities and a freshwater aquaculture and research and development facilities.

The Institute’s Offshore and Safety and Survival Centre is located in Foxtrap, located 30 km from the Institute’s main campus. This training facility includes an international class marine firefighting unit, a survival tank with environmental simulation capabilities, a helicopter underwater escape trainer and simulated ship structure which provides a practical experience in controlling and extinguishing all types of shipboard fires.

The Institute operates a marine base at the Southside of St. John’s harbor where its vessels are moored and serves as a base of operations for practical survival training.

The Institute’s newest facility is the Holyrood Marine Base, located in Holyrood. The current facilities at the marine base is Phase I of a three phase development; the current facility houses the Centre for Applied Ocean Technology (COTec) classroom and office space; electrical and mechanical laboratories; a wet gear change, wash-down and drying area for diving and safety and survival operations; and equipment storage. Planning is underway for subsequent development of the Marine Base.

In addition to facilities in St. John’s and surrounding area the Institute operates the Safety and Emergency Response Training (SERT) Centre located in Stephenville, which offers training courses in aviation, marine and industrial safety and emergency response.

OFFICE OF THE VICE-PRESIDENT

The Marine Institute’s main campus is located in St. John’s, within Pippy Park. It consists of classrooms and technical laboratories in support of its Programs, a flume tank, licensed seafood processing plant, simulation facilities and a freshwater aquaculture and research and development facilities.

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In addition to facilities in St. John’s and surrounding area the Institute operates the Safety and Emergency Response Training (SERT) Centre located in Stephenville, which offers training courses in aviation, marine and industrial safety and emergency response.

OFFICE OF THE VICE-PRESIDENT

The vice-president of Memorial University (Marine Institute) is primarily responsible for the operations of the Marine Institute.

The vice-president of Memorial University (Marine Institute) reports directly to the president and works in close collaboration with the Marine Institute’s Executive Committee, as well as the other vice-presidents and members of the senior management team of Memorial University. The Office of the Vice-President includes:

MI International

MI International is the focal point for international programs and activities of the Marine Institute. The unit brings an international dimension to the Institute, while enhancing the province’s export capability, by participating in international development projects and establishing linkages with other institutions around the world.

Department of Development and Engagement

The Department of Development and Engagement is responsible for business development, major strategic projects, government relations, alumni and community relations activities. In addition, the Department also oversees Regional Engagement, Alumni Affairs and Development.
DIARY FOR ACADEMIC YEAR 2016-2017

Joint Diploma/Bachelor of Technology
Diploma of Technology
Technical Diploma
Post-Graduate Certificate
Advanced Diploma
Technical Certificate

Students in Joint Diploma/Bachelor of Technology programs, or other students who are registered for undergraduate level courses as well as diploma level courses, please refer to the Memorial University academic diary for important dates and deadlines pertaining to the undergraduate level courses.

The Fisheries and Marine Institute of Memorial University of Newfoundland reserves the right to change the following dates:

FALL SEMESTER 2016

August 4, 2016, Thursday
Registration begins online (7:00 P.M.) - Fall Term for Joint Diploma/Bachelor of Technology, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate programs and Marine Engineering Work Term three (3). Registration will be ongoing until September 6, 2016

Students who have been accepted and conditionally accepted into programs requiring the submission of medicals and/or letters of conduct will not be permitted to register for classes unless satisfactory copies of the required medicals and/or letter of conduct have been received by the Registrar’s Office.

August 22, 2016, Monday
Start date - bridge training for Advanced Standing Mechanical stream students in Term three (3), ROV/UV program

August 29, 2016, Monday
Registration deadline and fees payment deadline for Technical Certificates - Bridge Watch, and Marine Diesel Mechanics
Late Registration fees will apply after this deadline

September 2, 2016, Friday
Registration deadline - Work Term three (3) Marine Engineering
End date - bridge training for Advanced Standing Mechanical stream students in Term three (3), ROV/UV program

September 5, 2016, Monday
No Classes - Labour Day

September 6, 2016, Tuesday
Orientation Activities - First year Joint Diploma/Degree, Technology and Technician Diploma students
Orientation Activities - Technical Certificates - Bridge Watch and Marine Diesel Mechanics

Registration Deadline - Fall Term for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate students
Late registration fees will apply after this date.

September 7, 2016, Wednesday
Classes Start - Fall Semester for all Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate, and Technical Certificates - Bridge Watch and Marine Diesel Mechanics
Start date of Work Term three (3) - Marine Engineering

Fees Payment Deadline - Fall Term

September 9, 2016, Friday
Last day to apply for Supplementary Exams for Technical Session & Summer Semester courses and Challenge Exams for Fall Semester

September 12, 2016, Monday
Safety training begins - Bridge Watch Technical Certificate

September 15, 2016, Thursday
Start date - Supplementary and Deferred Exams for Technical Session and Summer Semester courses and Challenge Exams for Fall Semester

September 17, 2016, Friday
End date - Supplementary and Deferred Exams for Technical Session and Summer semester courses and Challenge Exams for Fall Semester

DIARY FOR ACADEMIC YEAR 2016-2017

September 7, 2016, Monday
Classes are in effect - Classes follow Monday's Schedule

October 11, 2016, Tuesday
No Classes - Fall Break

October 12, 2016, Wednesday
Classes resume - Classes follow Monday's Schedule

October 13, 2016, Thursday
Classes follow Tuesday's Schedule

October 19, 2016, Wednesday
Last date - students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate Marine Diesel Mechanics Programs to drop courses and receive a 25% refund of tuition fees for the Fall Semester.

November 2, 2016, Wednesday
Last date - first time students in the first term of Joint Diploma/Degree, Technology and Technician Diploma Programs, to drop courses without academic prejudice.

November 11, 2016, Friday
No Classes - Remembrance Day Holiday

December 5, 2016, Monday
Registration begins for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate, and Technical Certificate students registering in the Winter 2017 Semester

December 9, 2016, Friday
Classes end - Fall Semester for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch and Marine Diesel Mechanics Programs

December 12, 2016, Monday
Exams begin - Students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch and Marine Diesel Mechanics Programs

December 16, 2016, Friday
End date - Marine Engineering Work Term three (3)

December 17, 2016, Saturday
Exams end - Students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch and Marine Diesel Mechanics Programs

No student union fees will be refunded after this date

Fees Payment Deadline - Fall Term

September 9, 2016, Friday
Last day to apply for Supplementary Exams for Technical Session & Summer Semester courses and Challenge Exams for Fall Semester

September 12, 2016, Monday
Safety training begins - Bridge Watch Technical Certificate

September 15, 2016, Thursday
Start date - Supplementary and Deferred Exams for Technical Session and Summer Semester courses and Challenge Exams for Fall Semester

September 17, 2016, Friday
End date - Supplementary and Deferred Exams for Technical Session and Summer semester courses and Challenge Exams for Fall Semester

September 21, 2016, Wednesday
Last date for students to add courses in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch Marine and Diesel Mechanics programs for Fall 2016 semester.

Last day to opt out of health and/or dental insurance in the Fall semester

Last date - students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate - Marine Diesel Mechanics to drop courses and receive a 100% refund of tuition fees and student union fees for the Fall, 2016 Semester.

Fees Payment Deadline - Fall Term
**DIARY FOR ACADEMIC YEAR 2016-2017**

**WINTER SEMESTER 2017**

- December 30, 2016, Friday: Registration Deadline - Winter Term for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch and Marine Diesel Mechanics Programs
- January 3, 2017, Tuesday: Classes start - Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch and Marine Diesel Mechanics Programs
- January 3, 2017, Tuesday: Start date - Work Term two (2), Marine Engineering
- January 5, 2017, Wednesday: Last day to apply for Supplementary Exams for Fall Semester courses and Challenge Exams for Winter Semester
- January 9, 2017, Monday: Supplementary, Deferred and Challenge Exams start
- January 10, 2017, Tuesday: Supplementary, Deferred and Challenge Exams end
- January 17, 2017, Tuesday: Last date - Students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate Marine Diesel Mechanics Programs to add courses for the Winter Semester
- January 24, 2017, Tuesday: Last date - Students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate Marine Diesel Mechanics Programs to drop courses and receive 100% refund of tuition fees and student union fees for the Winter Semester
- January 27, 2017, Friday: Classes end - Bridge Watch Technical Certificate
- January 31, 2017, Tuesday: Last date to apply for Examination Re-reads of Fall 2016 exams
- February 1, 2017, Thursday: Last date to apply for Credit Transfer for Winter Semester
- February 2, 2017, Friday: Last date - Students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate Marine Diesel Mechanics Programs to drop courses and receive a 50% refund of tuition fees
- February 7, 2017, Wednesday: No student union fees will be refunded after this date
- February 17, 2017, Tuesday: Last day to apply for Scholarships for Winter Semester
- February 24, 2017, Friday: Safety Training ends - Bridge Watch Technical Certificate
- March 6, 2017, Monday: Work Term begins - Bridge Watch Technical Certificate
- March 10, 2017, Friday: No Classes - Winter Break begins
- March 13, 2017, Monday: No Classes - Mid-March Holiday (Winter Break)
- March 14, 2017, Tuesday: Classes follow Monday's schedule

Please refer to the Student Fees Refund Policy in the Fees and Financial Information Section of the Marine Institute Academic Calendar, for the drop/refund deadlines for Technical Session courses relative to the various dates for Technical Sessions.

- March 15, 2017, Wednesday: Classes follow Friday's schedule

Please refer to the Student Fees Refund Policy in the Fees and Financial Information Section of the Marine Institute Academic Calendar, for the drop/refund deadlines for Technical Session courses relative to the various dates for Technical Sessions.

- April 14, 2017, Friday: No Classes - Good Friday
- April 17, 2017, Monday: No Classes - Easter Holiday

**TECHNICAL SESSION AND SUMMER SEMESTER 2017**

- April 18, 2017, Tuesday: Start date - Technical Session three (3) Nautical Science
- April 18, 2017, Tuesday: Start date - Safety Training for Marine Diesel Mechanics
- April 18, 2017, Tuesday: Start date - FDTE 2118 (Canned Foods and Thermal Processing) - Advanced Diploma in Food Safety and Joint Diploma/Degree (Food Technology)
- April 24, 2017, Monday: Start date - Work Term two (2) Advanced Diploma in Food Safety and Joint Diploma/Degree (Food Technology)

Please refer to the Student Fees Refund Policy in the Fees and Financial Information Section of the Marine Institute Academic Calendar, for the drop/refund deadlines for Technical Session courses relative to the various dates for Technical Sessions.

- April 21, 2017, Friday: End date - FDTE 2118 (Canned Foods and Thermal Processing) - Advanced Diploma in Food Safety and Joint Diploma/Degree (Food Technology)
- April 24, 2017, Monday: Start date - Work Term one (1) Joint Diploma/Degree Food Technology
- April 24, 2017, Monday: Start date - Work Terms one (1) Joint Diploma/Degree Food Technology
- April 24, 2017, Monday: Start date of Technical Session for students in Joint Diploma/Degree, Diploma Programs (other than those which started April 18th) and the Advanced Diplomas in Water Quality
- April 26, 2017, Wednesday: Last date to apply for Supplementary and Deferred Exams for Winter Semester courses and Challenge Exams for Technical Session
- May 4, 2017, Thursday: Supplementary, Deferred and Challenge Examinations begin
- May 5, 2017, Friday: End date - SFTY 1125 (SVOP), SFTY 2102 (Med A3), SFTY 1101 (Standard First Aid) and Boat Handling - Advanced Diploma in Sustainable Aquaculture
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>May 5, 2017, Friday</td>
<td>End of Winter Semester - Advanced Diploma in Sustainable Aquaculture and Advanced Diploma in Food Safety</td>
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<td>End date - FDT2 3102, FDT2 3104, FDT2 3108 - Joint Diploma/Degree (Food Technology)</td>
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<td></td>
<td>End of Technical Session 1 - Joint Diploma/Degree (Food Technology)</td>
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<td>Supplementary, Deferred and Challenge Examinations end</td>
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<td>May 8, 2017, Monday</td>
<td>Last date to add courses for Summer Term - Marine Engineering, Term six (6)</td>
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<td>Last date - students in Marine Engineering Term six (6) to drop courses and receive a 100% refund of tuition fees and student union fees for the Summer 2017 Semester.</td>
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<td>No student union fees will be refunded after this date</td>
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<td>May 12, 2017, Friday</td>
<td>End Date - Work Term - Bridge Watch Technical Certificate</td>
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<td>May 15, 2017, Monday</td>
<td>Start of Work Term - Advanced Diploma in Food Safety</td>
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<td>Start Date - Work Term two (2) - Joint Diploma/Degree (Food Technology); Advanced Diploma in Sustainable Aquaculture</td>
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<td>Last date - students in Marine Engineering Term six (6) to drop courses and receive a 50% refund of tuition fees the Summer 2017 Semester.</td>
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<td>May 22, 2017, Monday</td>
<td>No Classes - Commonwealth Day</td>
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<td>May 23, 2017, Tuesday</td>
<td>Classes follow Monday's schedule</td>
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<td>Last date to apply for Credit Transfer for Technical Session and Summer Semester</td>
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<td></td>
<td>Last date to apply for Examinations Re-reads of Winter 2017 exams</td>
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<td>Last day - students in Marine Engineering Term six (6) to drop courses and receive a 25% refund of tuition fees for the Summer 2017 Semester.</td>
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<td>(No refunds will be granted to students in Summer Semester Programs after this date)</td>
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<td>May 24, 2017, Wednesday</td>
<td>End date - Technical Session two (2) - Marine Environmental Technology</td>
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<td>May 26, 2017, Friday</td>
<td>End date - Technical Sessions one (1), two (2) and three (3) - Naval Architecture</td>
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<td>End date - Technical Sessions one (1), two (2) and three (3) - Marine Engineering Systems Design</td>
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<td>End date - Technical Sessions three (3) - Ocean Mapping</td>
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<td>End date - Safety Training for Advanced Marine Engineering Term seven (7)</td>
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<tr>
<td>May 29, 2017, Monday</td>
<td>Final Exam Day - Technical Session two (2) - Naval Architecture</td>
</tr>
<tr>
<td></td>
<td>Final Exam Day - Technical Session two (2) - Marine Engineering Systems Design</td>
</tr>
<tr>
<td></td>
<td>Start Date - Safety Training Marine Engineering Technical Session two (2)</td>
</tr>
<tr>
<td>May 30, 2016, Tuesday</td>
<td>Start Date - Safety Training Marine Engineering Technical Session one (1)</td>
</tr>
<tr>
<td>June 2, 2017, Friday</td>
<td>End date - Technical Session one (1) and two (2) - Ocean Mapping</td>
</tr>
<tr>
<td></td>
<td>End date - Technical Sessions one (1) and two (2) - ROV/UV Programs</td>
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<tr>
<td></td>
<td>End date - Technical Session Advanced Diploma in Water Quality</td>
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<tr>
<td></td>
<td>End date - Work Term two (2) - Marine Environmental Technology</td>
</tr>
<tr>
<td></td>
<td>Safety Training Ends - Marine Diesel Mechanics</td>
</tr>
<tr>
<td>June 5, 2017, Monday</td>
<td>Exams begin - Technical Session one (1) - Ocean Mapping and ROV/UV Programs</td>
</tr>
<tr>
<td></td>
<td>Start date - Work Term - Ocean Mapping Program</td>
</tr>
<tr>
<td>June 6, 2017, Tuesday</td>
<td>Last date - students in Marine Engineering Term six (6) to drop courses without academic prejudice</td>
</tr>
<tr>
<td></td>
<td>Start date - Work Term - ROV/UV</td>
</tr>
<tr>
<td>June 8, 2017, Thursday</td>
<td>Exams end - Technical Session one (1) - Ocean Mapping and ROV/UV</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:**

Because of sailing and company schedules, and work term availability the dates for Work Terms must be flexible and may not always begin and end on the dates specified in this Diary.
null
### MARINE INSTITUTE GOVERNANCE

#### ACADEMIC COUNCIL 2016 - 2017

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jewer, J.</td>
<td>B.Comm. (Co-op) (Hons.) Memorial, MASc, Ph.D. University of Waterloo</td>
</tr>
<tr>
<td>Keats, C.</td>
<td>Dip.Tech. (Marine Environmental) Marine Institute, B.Tech. Memorial, M.Env.Sci. Memorial</td>
</tr>
<tr>
<td>Livingston, D.</td>
<td>B.Sc. Acadia University, Advanced Diploma (Hydrographic Survey) Centre of Geographic Sciences, Nova Scotia</td>
</tr>
<tr>
<td>Matchem, J.</td>
<td>B.Eng., B.Ed. (Post Secondary) Memorial</td>
</tr>
<tr>
<td>Matchim, R.</td>
<td>B.Eng. Memorial</td>
</tr>
<tr>
<td>Ragunathan, J.</td>
<td>B.Eng. Madurai Kamaraj University, India, M.Eng.</td>
</tr>
<tr>
<td>Roche, R.</td>
<td>B.Eng. Memorial</td>
</tr>
<tr>
<td>Roy, A.</td>
<td>CEGEP Diploma (Surveying), Limoilou College, MSc. Memorial</td>
</tr>
<tr>
<td>Smith, W.</td>
<td>Red Seal Industrial Electrical and Instrumentation Controls, Diploma Electronics Technology (CET) College of Fisheries, B.Tech., MSTM, B.Ed. (Post-Secondary) Memorial</td>
</tr>
<tr>
<td>VanderVoort, R.</td>
<td>B.Sc. (Applied Physics) University of Windsor</td>
</tr>
<tr>
<td>Venkatraman, S.</td>
<td>B.Eng. Bharathidasan University, India, M.Eng. SASTRA University, India, B.Ed Memorial</td>
</tr>
</tbody>
</table>
1. APPLICATION FOR ADMISSION

1.1 Non-Degree Programs

A Marine Institute Application for Admission is required for all Marine Institute non-degree programs. A non-refundable application fee of $50 (plus an additional $50 fee for international applicants and applicants transferring from post-secondary institutions outside of Newfoundland and Labrador), must accompany each application. The documents required for determination of eligibility for admission to each Marine Institute program are listed in the appropriate area of the Marine Institute Application for Admission, as well as in the Admission Requirements section of this calendar. An application is considered to be complete only upon receipt of all required documents and application fees. Applicants who have previously attended the Marine Institute and have not registered in courses for the past two consecutive semesters are required to submit a new Application for Admission/Readmission together with the $50 application processing fee.

Note:

Transcripts must be submitted by the issuing institution directly to the following address:

Registrar's Office
Marine Institute
P.O.Box 4920
155 Ridge Road
St. John's, NL
A1C 5R3

Copies submitted by applicants will not be considered official documents.

The application deadline for Fall term admission is April 15th for Canadian applicants and March 1st for International applicants. Applications received after stated deadlines will be processed as time and resources permit. Early application is recommended as limited resources and facilities may limit enrolment.

Applicants should note that all documents (including transcripts) used for admission purposes become the property of the Marine Institute and are not returned to the applicant. Documents submitted by applicants who are not accepted, or who do not attend, are retained for one year after which time they are destroyed.

The Marine Institute reserves the right to refuse admission to any applicant. Application or admission enquiries should be directed to:

Admissions Officer
Office of the Registrar
Fisheries and Marine Institute of Memorial University
P.O. Box 4920
155 Ridge Road
St. John's, NL
A1C 5R3

1.2 Bachelor Degree Programs

Applicants seeking admission or re-admission to the Bachelor of Maritime Studies or Bachelor of Technology programs of the Fisheries and Marine Institute of Memorial University of Newfoundland are required to apply for admission to Memorial University of Newfoundland. Applicants should consult the Memorial University Calendar and refer to the Regulations Governing Admission/Readmission to Memorial University as well as to the Fisheries and Marine Institute section of the Memorial University Calendar for the regulations governing each program.

If the applicant has attended Memorial University or the Marine Institute during any of the previous three semesters, a General Memorial University Application for Admission is not required. Students who are currently attending or have attended post-secondary institutions other than the Marine Institute or Memorial University are required to supply official transcripts. Transcripts should be submitted by the appropriate institution directly to the following address:

Registrar's Office
Memorial University of Newfoundland
St. John’s, NL
A1C 5S7

1.3 Master's Degree Programs

Applicants for the Master of Marine Studies (Fisheries Resource Management), Master of Marine Studies (Marine Spatial Planning and Management), Master of Maritime Management (MMM) and Master of Technology Management (MTM) programs must apply for admission through Memorial University's School of Graduate Studies. Information concerning application procedures can be obtained from the Memorial University Calendar.

Inquiries concerning the degree programs listed above may be directed to:

Coordinator of Advanced Programs
Fisheries and Marine Institute of Memorial University
P.O. Box 4920
155 Ridge Road
St. John’s, NL
A1C 5R3

Telephone: (709) 778-0682 or 1-800-563-5799
Fax: (709) 778-0322
E-Mail: cap@mi.mun.ca

Note:

Transcripts submitted directed by applicants to the Office of the Registrar will not be accepted.
2. ADMISSION REQUIREMENTS

The regulations governing admission to Marine Institute programs are provided below. Applicants are advised to read the regulations for specific programs to ensure they are familiar with any additional requirements which may be required to determine eligibility for admission.

2.1 Physical Requirements

Applicants entering Marine Institute programs which lead to Transport Canada Certification for Seafarers should note that Transport Canada requires proof of satisfactory physical fitness prior to enrolling at any Transport Canada exam. This includes satisfactory visual acuity, colour vision, and hearing along with other physical requirements.

Applicants to selected Marine Institute programs are required to provide proof of physical fitness prior to enrollment. This proof is required for participation in simulated emergency situations and is also required for Transport Canada certification. The three medicals involved are the Marine Institute (MI Medical), Transport Canada (TC Medical Certificate) and the Canadian Association of Petroleum Physicians (CAPP) Offshore Medical. Students enrolled in programs which lead to seagoing careers must submit the appropriate medicals. Students in programs which involve emergency training do not lead to Transport Canada certification, require only the MI medical.

2.2 Programs Requiring Proof of Fitness

2.2.1 Joint Degree/Diploma Programs

- Diploma of Technology/Bachelor of Technology Ocean Mapping (TC Medical)
- Diploma of Technology/Bachelor of Technology (Underwater Vehicles) (CAPP Medical)
- Marine Engineering (TC Medical)
- Nautical Science (TC Medical)
- Remotely Operated Vehicles (ROV) Operator (CAPP Medical)

2.2.2 Diploma Programs:

- Marine Safety Directorate
  - John Cabot Building, 10 Barter’s Hill
  - P.O. Box 1300, St. John’s, NL A1C 6H8
  - (709) 772-5167

To obtain a list of physicians designated to perform the Seafarers’ Medical in your area please visit the Transport Canada website at:


The list of physicians designated to perform the MI Medical can be found on the web at:

http://www.mi.mun.ca/medical

The medical assessment guidelines for fitness to work offshore can be found at:


2.3 Criminal Record Check

Applicants to the Marine Institute are advised that employers may require a criminal record check as part of the recruitment and selection process for work term placement and/or graduate employment.

A criminal record check reports on the history of criminal conviction(s) finding(s) of guilt for an individual based on a search of police files. The certificate issued upon completion of the criminal record check must be current at the date of registration in a Marine Institute program. Students may be required to undergo an additional criminal background check prior to the commencement of a work term.

Two certificates that would meet the requirement are:

- Certified Criminal Record Check (from RCMP)
- Criminal Record Screening Certificate (from RNC)

It is important to note that if the check results in the identification of criminal conviction(s) or criminal finding(s), the student may not secure a work placement to meet the requirement for graduation.

Programs Requiring Criminal Record Check:

Joint Diploma of Technology/Bachelor of Technology Programs:

- Ocean Mapping
- Underwater Vehicles

Diplomas of Technology Programs:

- Nautical Science
- Marine Engineering
- Remotely Operated Vehicles

Technical Certificate Programs:

- Marine Diesel Mechanics
- Bridge Watch Program
- Fire Rescue

Other programs may require this document depending on industry requirements.

Please note that the criminal record check is only current at the time of issue and may need to be updated prior to commencement of a work term or program.

2.4 Readmission

Applicants seeking readmission to Marine Institute programs following a period of withdrawal should note that changes in regulations governing programs may be made. Students who have not interrupted their program may complete their requirements for graduation following the regulations in place when he/she started his/her program. Students who have interrupted their program may be required to complete additional courses as they must convert their program to fit the new regulations.

2.5 Advanced Standing

Applicants who have completed a specific level of certification, or who have completed a specific post-secondary academic program, (to be determined by the program for which Advanced Standing is being sought) at another accredited post-secondary institution, or at Marine Institute, may be eligible for Advanced Standing (admission to a level higher than first year/semester).

When advanced standing is granted, the following conditions apply:

- Courses are not recorded as individual transfer credits and may not be used to apply for transfer credit.
- The original grades are not recorded as graded courses on the Marine Institute academic record.
- Courses are not used in the calculation of cumulative average.

2.5.1 Joint Bachelor of Technology/Diploma of Technology in Underwater Vehicles

Applicants, who have successfully completed the two year Technician Diploma in Remotely Operated Vehicles (ROV) at the Marine Institute, are eligible to receive Advanced Standing in this program. Students approved for advanced standing commence their studies in Term 5 of the program. Additional courses may be required.

2.5.2 Technician Diploma in Remotely Operated Vehicles (ROV)

Applicants, who have completed a three year diploma of technology in either Electrical Engineering, Electronics Engineering, Mechanical Engineering or Marine Engineering, at another accredited post-secondary institution, or at the Marine Institute, may be eligible to receive Advanced Standing in this program. The first year foundation requirements are waived for students approved for advanced standing in this program and they commence their studies in Term 3 of the program.

2.5.3 Technical Certificate in Harvesting

Applicants, who possess a valid Fishing Master Class IV Certificate issued by Transport Canada, may be eligible to receive Advanced Standing in this program. The requirements of Term 1 are waived for students approved for advanced standing, and they commence their studies in Term 2 of the program.

2.6 Degree Programs

The Master of Marine Studies, Master of Technology Management, Master of Maritime Management, Bachelor of Maritime Studies and Bachelor of Technology degree programs are listed in this Calendar for information purposes only. These programs are governed by St. John’s Campus of Memorial University of Newfoundland and the admission and other academic regulations are outlined in the Memorial University calendar available at www.mun.ca/regofficalcalendar.

2.7 Post Graduate Certificate Programs

Applicants should possess an undergraduate degree, a three-year diploma of technology, or a combination of formal education and work experience which is acceptable to the Admissions Committee.

2.8 Advanced Diploma Programs

Candidates for admission to these programs are required to have official copies of all eligible undergraduate education transcripts submitted to the Registrar’s Office Marine Institute by the issuing Institution (Transcripts for applicants who have attended MUN will be obtained internally).

2.8.1 Sustainable Aquaculture

Candidates for admission to the Advanced Diploma in Sustainable Aquaculture must be graduates of an appropriate diploma of technology (three (3) years duration), or a degree, or may possess a combination of formal education and work experience acceptable to the Admissions Committee.

2.8.2 Food Safety

Candidates for admission to the Advanced Diploma in Food Safety must be graduates of an appropriate diploma of technology (three (3) years duration), or a degree, and have completed introductory courses in biology and chemistry or similar courses deemed acceptable.

2.8.3 Water Quality

Candidates for admission to the Advanced Diploma in Water Quality must be graduates of an appropriate diploma of technology (three (3) years duration), or a science degree, and have completed an introductory course in chemistry.

NOTE:

The Marine Institute reserves the right to refuse admission to any applicant.
2.9 Joint Diploma/Degree Programs, Diplomas of Technology and Technician Diplomas

The admission regulations below apply to all Joint Bachelor of Technology/Diploma of Technology programs and Diploma of Technology and Technician Diploma programs. Candidates for admission to these programs are required to have official copies of all high school and post-secondary education transcripts, submitted to the Registrar’s Office Marine Institute by the issuing Institution.

2.9.1 Applicants who have Followed the High School Curriculum of Newfoundland and Labrador

Newfoundland applicants applying to any Marine Institute Joint Diploma/Degree, Diploma of Technology or Technician Diploma program are required to have either a senior high school Level III Graduation Certificate; a grade 11 Public Examination Matriculation Certificate; a Level III Adult Basic Education (ABE) Certificate; or other qualifications judged by the Marine Institute to be high school equivalent.

High School Level III, Grade 11 or ABE graduates require the following for admission to a Marine Institute Diploma program:

2.9.2 High School Graduates - Level III

Applicants shall have completed Graduation Requirements for high school as set down by the Department of Education and obtained credits in each of the following, with a minimum combined average of 60% in the level three Mathematics, English and Science:

Mathematics: One of Mathematics 2200, 2201, 2204 or 2205 and one of Mathematics 3200, 3201, 3204, or 3206 (valued at 2 credits each). A minimum grade of 60% is required in 3201 or 3204

English: English 3201 (2 credits)

Science: four (4) credits in Laboratory Science, two (2) of which must be from either Biology 3201, or Chemistry 3202, or Physics 3204 or Earth Systems 3209. The remaining two (2) credits may be from 2000 level courses in the above subjects or from Science 1208.

2.9.3 High School Graduates - Grade 11 Public Examination Matriculation Certificate

A Grade 11 Matriculation Certificate with a minimum average of 60% in the required courses.

2.9.4 Adult Basic Education

Completion of Level III Adult Basic Education (A.B.E.) in the following Department of Education approved courses with a minimum of a 60% average in each of the following three areas:

Mathematics: 2104A, 2104B, 2104C, 3104A, 3104B, and 3104C

English: 3101A, 3101B, 3101C

Science: six (6) credits three (3) of which must be from either Biology 3101A, 3101B, 3101C OR Chemistry 3102A, 3102B, 3102C OR Physics 3104A, 3104B, 3104C OR Geology IS 3212

2.9.5 Applicants who have Followed the High School Curriculum of Other Provinces of Canada

Applicants from other provinces of Canada seeking admission to any Marine Institute Joint Diploma/Degree, Diploma of Technology or Technician Diploma program are required to have graduated from Grade XII in the University Preparatory Program (or Secondary V Certificate for Quebec applicants) with a passing mark in the required courses and an overall average of no less than 65% in these courses.

2.9.6 Applicants who have Followed the College of the North Atlantic Comprehensive Arts and Science Transition Program

Students who do not meet the requirements for admission but who do hold a high school diploma may be eligible for admission under this category. Students applying under this category must successfully complete all qualification requirements for the award of the Comprehensive Arts and Science (CAS) Transition Year Certificate from the College of the North Atlantic. A full outline of this program is available in the College of the North Atlantic Calendar which is available online at www.cna.nl.ca

2.9.7 Applicants for Concurrent Studies

Applicants in or about to enter their final year of high school with a superior academic record (i.e. normally an overall average of 85% or above in completed English, Math and Science courses at the 2000 or 3000 level) may apply to enrol in Marine Institute courses. The applicant for concurrent studies must be enrolled in a high school and completing a state of courses that meets the course requirements for admission as specified in 2.9.2 High School Graduated - Level III.

Applicants will be required to submit a letter requesting enrolment in a specific course and provide a list of final year registrations; an official high school transcript; and a letter from the high school principal or guidance counsellor clearly supporting admission for concurrent studies.

2.9.8 International Students Entering Transport Canada Approved Programs

Transport Canada examination and certification of seafarers is available only to Canadian Citizens and landed immigrants. International students completing these programs at the Marine Institute will receive a Diploma of Technology from the Marine Institute but they will have to write their certificate examinations in their own country.

Many programs at the Marine Institute include, in addition to classroom instruction, work terms which are compulsory components of the programs and are necessary in order to fulfill graduation requirements.

International students are responsible for finding their own work terms in their home country, and these work terms must be approved by the Marine Institute Placement Office.

2.10 Technical Certificate Programs

Please refer to regulations governing physical requirements as listed in this calendar.

2.10.1 Aquaculture

Applicants should possess the equivalent of Grade 9 education or appropriate education and/or industry experience acceptable to the Admissions Committee

2.10.2 Bridge Watch**

Candidates for admission to the Technical Certificate - Bridge Watch Program must have successfully completed, at a minimum, Grade 9 education. Proof of physical fitness must be provided by way of a signed Seafarer’s medical. As well, candidates must submit a clear Certificate of Conduct (a certified criminal record check).

2.10.3 Fire Rescue Program**

Candidates for admission to the Technical Certificate - Fire Rescue Program must have a High School diploma. Upon acceptance to the program, all candidates must pass a medical examination and submit a Certificate of Conduct from their Local Police Force. In addition candidates must possess a Valid Driver’s License with an Air Brake Endorsement.

2.10.4 Harvesting**

Candidates for admission to the Technical Certificate - Harvest Program must have 12 months of approved Transport Canada sea service on a vessel greater than 6 metres in length engaged on voyages beyond partially smooth water limits (Verification of Sea Time letter from Transport Canada) and hold current registration with either the Professional Fish Harvesters Certification Board of Newfoundland and Labrador or an equivalent fish harvester certification body of another Canadian province or territory.

2.10.5 Marine Diesel Mechanics**


2.11 Transport Canada Certification Training Programs

Students entering Transport Canada Certification Training Programs are required to be familiar with Transport Canada regulations governing the examination and certification of seafarers. Transport Canada requires that candidates attempting certification examinations have specific minimum periods of sea-service and/or prior certification qualifications. Applicants should refer to Transport Canada’s TP2593 for details on the periods of time required for each certificate.

Candidates interested in pursuing Canadian Certification for Seafarers should note that they are subject to certain minimum physical and residency requirements that are prescribed by Transport Canada. Please refer to Transport Canada’s Marine Personnel Regulations and the TP11343 (Medical Examination of Seafarers’ - Physician's Guide) for the related standards. Proof of physical fitness is also required for students to participate in Marine Emergency Duty (MED) Training which is compulsory for Transport Canada Certification programs. Please refer to regulations governing physical requirements as listed in this calendar.

2.12 Mature Students

Applications may be received from individuals who are 21 years of age or older within one month of the start of the program for which they are applying. The admission requirements outlined earlier describe what are viewed as the minimum qualifications individuals should have in order to succeed in each respective program area. However, the Marine Institute realizes that individuals may obtain the equivalent or other suitable qualifications from alternate sources to prepare them for technology programs.

Therefore, applicants in this category are required to demonstrate that they have gained educational, technical or practical expertise, in the intended field of study. Mature applicants must submit an Application for Admission to the Marine Institute and include the following documentation:

• a resume
• a letter of recommendation from employers or other individuals who can attest to an applicant’s qualifications
• official academic transcripts of high school and post-secondary studies
• proof of age

Since Admission as a mature student is not on the grounds of age alone, the Marine Institute reserves the right to refuse admission to any applicant.

2.13 Special Admissions

2.13.1 Applicants Requesting Special Consideration for Admission

Where circumstances warrant, applicants not meeting the regulations for Admission/Readmission to the Marine Institute may be admitted to the Marine Institute with the approval of the Marine Institute’s Committee on Special Admissions.

ADMISSION TO THE MARINE INSTITUTE

ADMISSION TO THE MARINE INSTITUTE

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2.13 Admission Criteria

- Applicants must submit a completed application for admission/ readmission, together with the appropriate fee and supporting documentation.
- Applicants must submit a letter to the Committee on Special Admissions outlining the grounds for requesting special consideration.
- Applicants must also provide a letter from a school principal, guidance counselor, employer or other responsible person substantiating these grounds.
- In order to allow sufficient time for reasonable and consistent consideration of special cases, supporting letters must be received at least one week prior to the beginning of the semester to which admission is being sought.

2.14 Transfers from Other Canadian Universities/Colleges

Students from other universities and colleges who apply to enter the Marine Institute will be considered for admission upon producing satisfactory documentation. Students forced to withdraw from another university or college will not be eligible for admission to the Marine Institute until the associated withdrawal penalty has been served. Candidates for admission are required to have official, original transcripts from all high schools and colleges or universities they have attended sent directly to the Registrar’s Office of the Marine Institute.

Students transferring from the College of the North Atlantic or from Memorial University’s degree programs should refer to the Newfoundland and Labrador Transfer Guide at www.aes.gov.nl.ca/postsecondary/transferguide/index.html for details on established credit transfer availability.

2.15 Applicants from Other Countries

Applicants from other countries must submit an Application for Admission to the Marine Institute and have official transcripts, and any other required documentation, forwarded to the Marine Institute well in advance of the semester in which they are seeking admission. All official transcripts must be submitted by the issuing institution directly to the Registrar’s Office of the Marine Institute. Please refer to the regulations governing English Proficiency Requirements as listed in this calendar for further information.

2.16 Credit Transfers and Challenge Examinations

Students transferring from other colleges or universities, and students with prior academic or work experience who feel they are eligible to earn credit from the Marine Institute for work completed towards the requirements of a Marine Institute program, may apply to earn this credit through either an Application for Transfer of Course Credit or through a Challenge Examination. Please refer to the section of this calendar concerning Academic Policies and Procedures for an explanation of the policies, regulations and procedures governing transfer of credit and challenge examination.

2.17 English Proficiency Requirements

- English Language Proficiency Requirements will apply to all applicants. English is the primary language of instruction in programs offered at the Fisheries and Marine Institute of Memorial University. Applicants seeking admission must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of the English language status, applicants will be required to provide proof proficiency in the English language in one of the following forms:
  - Successful completion of the equivalent of full-time instruction in an English language secondary institution recognized by the Fisheries and Marine Institute of Memorial University of Newfoundland including successful completion of at least two courses in English language and/or literature at the Grade XII (or equivalent) level.
  - Please note that these courses must be other than E.S.L. (English as a Second Language) courses.
  - Test of English as a Foreign Language (TOEFL)
    - A minimum score of 550 is required on the paper-based test, or a minimum score of 213 on the computer-based test or a minimum score of 79 on the internet based test of the Test of English as a Foreign Language (TOEFL). The official results of the TOEFL must be forwarded directly to the Marine Institute from the TOEFL Testing Centre. Applicants submitting a TOEFL score of less than 550 or 213 or 79 will be considered as not having met the English Language requirements of this institution and will not be admitted until English proficiency can be demonstrated. Information pertaining to the TOEFL program is available from the Educational Testing Service, Box 899, Princeton, New Jersey, U.S.A., 08540.
  - The Michigan English Language Assessment Battery (MELAB)
    - A minimum score of 85 will be considered as having demonstrated English Language proficiency for admission purposes only. The official results of the MELAB must be forwarded directly to the Marine Institute from the MELAB Testing Centre. Applicants submitting a Michigan English Language Assessment Battery with results of less than 85 will be considered as not having met the English Language requirements of this institution and will not be admitted until English proficiency can be demonstrated. Information on the Michigan Test of English as a Second Language (ESOL) may be obtained from: Michigan English Language Assessment Battery with results of less than 85 can be demonstrated Information pertaining to the Michigan Test of English as a Second Language (ESOL) may be obtained from: University of Michigan, 2001 North University Building, Ann Arbor, Michigan, U.S.A., 48109-1057.
  - International English Language Testing System (IELTS)
    - A minimum band score of 6.0 on both the Band Score and the Reading Band is required. The official results of the IELTS must be forwarded directly to the Marine Institute from the IELTS Testing Centre. Applicants submitting an IELTS assessment with results of less than 6.0 on the Overall Band Score and/or a band score of less than 6.0 on the Writing Band and/or the Reading Band will be considered as not having met the English proficiency requirements of this institution and will not be admitted until proficiency in English can be demonstrated. Information on the International English Language Testing System may be obtained from IELTS Inc., 100 East Corson Street, Suite 200, Pasadena, CA 91103, USA.
  - The Canadian Academic English Language (CAEL) Assessment
    - Minimum band scores of between 50 and 60 in each of the four tests (Reading, Writing, Listening, Speaking), with at least two band scores of 60 are the minimum requirements necessary for admission to the Marine Institute. The official results of the CAEL Assessment must be forwarded directly to the Marine Institute from the CAEL Assessment Centre. Applicants submitting a CAEL Assessment of less than 50 in each of the four skills tested, and/or an assessment in which there are not at least two band scores of at least 60, will be considered as not having met the English proficiency requirements of this institution and will not be admitted until proficiency in English can be demonstrated. Information pertaining to the Canadian Academic English Language (CAEL) Assessment may be obtained from: The Canadian Academic English Language Assessment Office 300 St. Pat’s Building, Carleton University 1125 Colonel By Drive Ottawa, Ontario, Canada K1S 5B6 Online: www.cael.ca Email: cael@carleton.ca Tel: 613-520-2600 ext. 2271
  - Test of English for Scholars and Trainees (CanTEST)
    - Test scores of 4.5 in the listening comprehension and reading comprehension sub-tests and a score of 4 in writing are required to satisfy Marine Institute English proficiency requirements. Information pertaining to the CanTEST must be forwarded directly to the Marine Institute from the CanTEST Testing Centre. Applicants submitting a CanTEST test score of less than 4.5 in the listening comprehension and reading comprehension sub-tests and a score of less than 4 in writing, will be considered as not having met the English Language requirements of this institution and will not be admitted until English proficiency in this institution can be demonstrated. Information pertaining the Canadian Test of English for Scholars and Trainees may be obtained from: CanTEST Language Testing Services 70 Laurier Avenue East Room 130, Ottawa, ON, K1N 5N5
  - Pearson Test of English Academic (PTE Academic)
    - A minimum score of 58 in each of the reading, writing, listening, and speaking components of the PTE Academic is required. Information about the PTE Academic is available online at www.pearsonpte.com.
  - Cambridge English for Speakers of Other Languages (ESOL)
    - A minimum grade of "B" in the Certificate of Advanced English (CAE) or a minimum grade of "C" in the Certificate of Proficiency in English (CPE) are required. Information regarding these examinations may be obtained from University of Cambridge ESOL Examinations via www.cambridgeenglish.org.

2.18 Admission Status

- Non-Degree Programs

The admission status of an application to the Marine Institute for non-degree programs may fall in one of the following categories:

2.18.1 Incomplete:

This classification refers to an application which has been received and acknowledged and the review of the applicant for admission is currently underway or about to begin. Following this review, additional information may be requested from an applicant or the applicant may be classified as Accepted, Conditionally Accepted, Not Accepted or Wait Listed.

2.18.2 Complete:

This classification indicates that all information and documentation has been received and the application is ready for review.

2.18.3 Decision:

This classification indicates that a decision has been made on the application. Decisions include:

- Accepted: An applicant will be officially accepted when all entrance requirements are met and a position is reserved in the program for the applicant.
- Conditionally Accepted: Students in their final year of high school (Level III) in Newfoundland, or individuals attending other post-secondary or other secondary institutions may be Conditionally Accepted to the Marine Institute prior to the official release of their final grades and academic standing.
- Not Accepted: An individual does not meet the entrance requirements.
- Wait Listed: A final determination of each applicant’s admission status will be made upon receipt of the official grades and standing. Conditionally Accepted applicants who meet all of the entrance requirements will be granted formal acceptance to the Marine Institute program for which they have been conditionally accepted. Conditionally Accepted applicants who fail to meet the program entrance requirements will be classified as Not Accepted.

Not Accepted: An applicant is not accepted to the Marine Institute when the individual does not meet the entrance requirements.
2.18.4 Wait Listed:
An applicant is placed in this category when the program or program option for which he/she applied is full. The applicant has met the program entrance requirements and has been placed on a waiting list and will be offered a place as one becomes available.

For diploma program admission, the waiting list is maintained up to the deadline to register/add courses in the academic semester.

2.18.5 Withdrawn:
At any time during the application review and admission process, if the applicant notifies the Registrar’s Office that he or she is not interested in joining the Marine Institute program for which he or she has applied for admission, the application will be withdrawn and no further communication will be made with the applicant concerning admission or registration for the program offering in question.

2.18.6 Application Rejected, Incomplete
Any applications which are incomplete after the registration deadline in any given term will be assigned a decision application rejected (MIADM). You must contact the registrar’s office to discuss your application eligibility for subsequent terms.

The Fisheries and Marine Institute of Memorial University is governed by policies, rules and regulations designed to ensure fair and equitable treatment for the entire Institute community. Some of the regulations deal with the normal workings of the Institute (registration deadlines, etc.) and pertain to all students. Other regulations, however, especially those concerned with readmission, suspensions, deferred examinations and academic dishonesty, apply to certain students in specific situations. Every student has the right to appeal decisions resulting from the application of Marine Institute regulations.

3. INSTITUTE RULES

3.1 Academic Misconduct
The Marine Institute values academic honesty highly and does not tolerate academic misconduct. All students are required to produce original work for evaluation where it is requested and are expected to be familiar with all of the regulations governing academic misconduct. Students who commit acts of misconduct are subject to disciplinary action governed by the policies outlined further in this section of the Calendar. Acts of academic misconduct include, but are not limited to:
- Cheating on assignments, tests, projects, reports, laboratories and examinations
- Impersonating another student or allowing oneself to be impersonated
- Plagiarism
- Theft of academic materials
- Use and/or distribution of stolen academic materials
- Submitting false information
- Submission of the same material for two or more courses
- Academic Misconduct such as tampering with examinations, gaining unauthorized access to examinations, removing materials from the examination room, violating other examination regulations or any other acts not described above which, in the consideration of the Marine Institute, are to be acts of misconduct.

3.2 Discipline
The general discipline of the Marine Institute is based on rules of common sense and courtesy. Smoking is not permitted. Defacement of buildings and damage to equipment are considered serious offenses. The Marine Institute reserves the right to dismiss any student who does not comply with these regulations.

3.3 Student Attendance
It is the Marine Institute’s policy that attendance in all classes, labs, and all other scheduled meetings is compulsory for students in Diploma of Technology and Certificate programs. In exceptional cases, the course instructor may excuse a student from one or more classes. Acceptable cause for an excused absence may include illness, bereavement, family emergencies or any other cause deemed acceptable by the instructor. It is the student’s responsibility to provide satisfactory proof of the necessity for absence.

A majority of the courses in some programs, including Nautical Science and Marine Engineering and all industry response courses, have specific minimum attendance requirements. In first term courses, an attendance rate of 100% is mandatory. However, unless otherwise specified, a rate of unexcused absence that exceeds 10% is considered to be unacceptable. Students are strongly advised to review and understand the course outline for each course for which they are registered with respect to attendance requirements and other specific regulations governing that course.

A student who is inexcusably absent for more than an acceptable number of the scheduled meeting times for a course will be deemed to be in violation of this policy and will be required to consult the program chair or designated advisor. If, following consultation with the program chair or designate, the student’s attendance does not improve, he or she may be discontinued from that course. In such cases, if this occurs following the course drop or fees refund deadline, the student will be subject to any applicable academic or financial prejudice.

Attendance is included as part of the student’s academic record and will be one of the criteria used to determine eligibility for continuation in a program or for certification by the Marine Institute or external agencies such as Transport Canada. Specific guidelines and related procedures are available from the offices of each School Head or the Registrar.

The registration of each student in a course implies that he or she is a candidate for the examination and has agreed to abide by the above policy.

3.4 Usage of Computer Facilities
The following guidelines are a subset of the Regulations Governing MI Computer Facility Usage and are applied to all individuals accessing computer systems:

- All access to computer services and the issuing of computer accounts and passwords, must be approved by the Computer Services division of the Marine Institute in accordance with the Regulations for Issuing Accounts.
- No attempt should be made to discover other users’ passwords nor should any such passwords discovered by chance be used. Passwords are distributed to individuals for the purpose of gaining access to computer systems and should remain confidential. Any suspected leak of a password or other loopholes in security system should be reported immediately to the Computer System department.
- Software applications and other proprietary information are not to be copied, this includes information which has been stored by Computer Services or any other computer users. This could result in a breach of copyright or license agreement.
- The hardware components of any computer system must not be moved. The software or hardware configuration of computer systems must be altered.
- The Marine Institute’s computing facilities may not be used for non-institutional projects, or for personal or commercial purposes.
- No one should deliberately attempt to degrade the performance of a computer system or to deprive others of resources or access to any university computer system.
- Software programs that were not previously installed on the systems should not be operated. Any such use could increase the risk of infection with computer viruses.

Computer systems are not to be used for games or other non-academic recreational activities (e.g. MP3’s, Chat, On-line games).

Abusive, fraudulent, or harassing messages are not to be sent or stored by users. Storage and possession of property is strictly prohibited.

Violations of the Regulations governing MI Computer Facility Usage may result in disciplinary action.

4. EXPLANATION OF TERMS
The Marine Institute’s academic year runs from the first day of September to the last day of August of each year.

- A Term or Semester means a period of approximately fifteen weeks during which regular classes are held, and, for diploma of technology, technician diploma and advanced diploma programs, in which there are at least 65 teaching days. Normally begins in January and the summer semester in May.
- Technical Session is a period of study which is normally six weeks in duration, but may be anywhere from three to eight weeks in duration, depending on the program of study. The Technical Session normally follows the Winter semester or may precede the Summer session for programs which normally have one or more scheduled summer sessions. Technical session normally begins in April of each year.
- A course is a unit of work in a particular subject which normally contains credit towards the fulfillment of the requirements for a particular certificate or diploma and for which achievement of the established learning objectives are formally measured and recorded.
- A credit is awarded for each course completed in which the student obtains at least the minimum passing grade.
- A prerequisite course is a course which must be successfully completed prior to enrollment in the course for which it is required. A co-requisite course is a course which may be taken concurrently with the course for which it is required.
- Program refers to an academic program forming a coherent unit, including any modules, core courses, and electives which, if other requirements are met, qualifies the candidate to receive the appropriate award.
- A co-operative certificate or diploma is to be conferred upon candidates completing a Marine Institute Program who are approved by the Marine Institute Academic Council. Awards are to be conferred upon the successful completion of a program of study which has been approved by the Marine Institute Senate (August, 1994 or earlier) or Academic Council (September, 1995 or later). At the Institute, these include Advanced Diplomas, Diplomas of Technology, Technician Diplomas, Certificates, Certificates of Achievement and Certificates of Participation for Marine Institute Advanced Diplomas, Technology Diplomas, Technician Diplomas and Certificates are conferred once a year only regardless of when program requirements are completed. This occurs during the Institute’s annual graduation ceremony held in June.

Advanced Diploma programs provide in-depth training in a specific discipline, usually requiring at least a first or three-year technology diploma program. These are normally one academic year in length, except that work terms or job placements may be required. This period can extend beyond this time. Program duration in years is shown on the Diploma.

Post Graduate Certificate program is designed to provide students with specialized knowledge that is less intensive than an advanced Diploma or Master’s Degree. A certificate program represents a focused collection of courses that when completed affirm the student a record of academic accomplishment in a given discipline.

Joint Degree/Diploma
- Diploma of Technology programs are designed to prepare graduates for employment as technicians. These programs are normally three academic years in length. However, some programs may extend beyond this time as a result of work term or job placement requirements. This period can extend beyond this time. Program duration in years is shown on the Diploma.
- Technician Diploma programs are designed to prepare graduates for employment as technicians. These programs are normally two years in length.
- Technical Certificate programs provide training in specific technical areas. Programs may be modular, full or part-time and of variable duration, but not less than one academic semester or its equivalent.
- Certificates of Achievement are issued upon successful completion of an academic program of less than one academic semester, or its equivalent, in length, upon completion of an academic course for which learning is measured and evaluated.
- Certificates of Participation are issued upon completion of a non-formalized course or workshop or program, lasting from a few hours to several days for which specific learning or performance is not measured or evaluated.
5. PARTNERSHIP/SUPPORTED PROGRAMS

From time to time the Marine Institute enters partnerships for the purpose of developing or delivering courses or programs. These partnerships may be with other educational institutions, with public agencies or with private companies. Where appropriate, such partnerships may be formally recognized on certificates. This may be done in one of the following ways:

5.1 The Marine Institute is the Awarding Institute

When a course or program is developed largely by the Marine Institute, either in partnership with or on behalf of another institution or agency, an appropriate Marine Institute Certificate will be awarded. This certificate may contain the phrase “designed in partnership with...” as an additional description of the course or program.

5.2 A Joint Certificate is Awarded

When a course or program is developed and/or delivered in partnership with another educational institution, a joint certificate formally recognizing both institutions may be awarded. This certification would be consistent with Marine Institute criteria and its award would require Marine Institute Academic Council approval.

The certificate itself would recognize both institutions and contain the signatures of both chief executive officers or duly authorized officers of either institution.

6. CREDIT TRANSFERS

6.1 Applying for Transfer of Credit

Students applying for transfer of credit must submit an Application for Transfer of Credit to the Office of the Registrar, preferably with their Marine Institute Application for Admission.

The Application form can be obtained upon request from the Office of the Registrar or the information centre. The Application for Credit form can be obtained upon request preferably with their Marine Institute Application for Admission. Students applying for transfer of credit must submit an application to the Office of the Registrar, or the information centre.

The Application for Credit form can be obtained upon request preferably with their Marine Institute Application for Admission. Students applying for transfer of credit must submit an application to the Office of the Registrar, or the information centre.

6.2 Transfer Credit - Advanced Diplomas and Post-Graduate Certificates

It must be emphasized that the transfer of credit is not an automatic occurrence. Upon recommendation of the Program Chair and the School Head, work completed at the Marine Institute may be transferred in partial fulfilment of advanced diploma or post-graduate certificate requirements. The following restrictions apply:

• A student who has successfully completed graduate level courses at another institution may be awarded credit for courses completed in the current Program provided a mark of 56% or higher was received.

• A student who has successfully completed graduate level courses at another institution recognized by Senate may, upon admission to an Advanced Diploma or Post-Graduate Certificate Program at the Marine Institute, apply for transfer appropriate courses to the current Program, provided such courses have not been used to satisfy other requirements of the current Program and provided a mark of 65% or higher was received.

Advanced/graduate course(s) (which includes Advanced Diploma, Post-Graduate Certificate, and Masters level courses), shall not be considered eligible for transfer if they have been completed more than seven (7) years prior to the date of admission into the current Program.

The maximum number of transfer credits shall not exceed two credits per Advanced Diploma or Post-Graduate Certificate Program.

All course work considered for transfer credit must clearly be advanced/graduate level work (which includes Advanced Diploma, Post-Graduate Certificate and Masters level work).

A transfer credit recommended by the student may warrant consideration for academic credit may consist of courses taken at other education institutions or skills acquired from work or learning outside the Marine Institute. It should be noted that the Marine Institute reserves the right to evaluate each student’s application and determine which courses may be considered for credit.

6.3 Evaluation of Credit Applications

Credit for courses completed at another institution may be under the following conditions:

• Students applying for admission who have completed the Marine Institute under the following conditions:

Students apply to the Registrar on the Application for Transfer of Credit form. The Registrar may request an official transcript, a course outline, or syllabus and information about the number of hours of instruction.

• Only those courses officially accepted will be recorded as transfer credit courses on the Marine Institute transcript.

• Credit transferred from other institutions will be recorded only upon a student’s registration in a program.

The Marine Institute reserves the right to award credit for any application it may receive and process.

6.4 Transfers From Other Newfoundland Post-secondary Institutions

For students transferring from another Newfoundland institution to the Marine Institute, the Transfer Guide, published by the Newfoundland and Labrador Council on Higher Education, is a compendium of current transfer credit precedents available to students in Newfoundland. It is a valuable reference guide for matters relating to the transfer of credit from one institution to another within the Newfoundland public post-secondary education system. In considering applications for credit transfer, this guide is used by the Marine Institute to cross-reference previously approved credit transfers. A copy of this guide is available online at www.aes.gov.nl.ca/postsecondary/transferguide/index.html.

7. CHALLENGE EXAMINATIONS

A Challenge Examination is written by a student who wishes to seek credit in a course by a procedure other than normal class instruction or transfer of credit from another post-secondary institution.

The Marine Institute of Memorial University recognizes that some students may have achieved competence in certain subject areas through prior learning or work experience. It may be the case that student’s prior learning or work experience may warrant consideration for academic credit may consist of courses taken at other education institutions or skills acquired from work or learning outside the Marine Institute. It should be noted that challenge for credit is not offered for Work Terms or Internships. Students will be required to show documented proof of having received the experience. The Marine Institute shall have the responsibility to evaluate each student’s application and determine which courses may be challenged, subject to the procedures and regulations outlined below:

7.1 Application for a Challenge Examination

Students must complete an Application for a Challenge Examination which can be obtained from the Office of the Registrar. The student must complete the application and submit it to the Registrar. The application requires the student to document the previous education or work experience which the student believes is adequate preparation for challenging the course in question for credit.

The Registrar’s office forwards applications to the appropriate Program to School for evaluation of each student’s request. This evaluation determines if credit for the course may be obtained in this manner. If an appropriate examination format is approved for the applicant by the School, the School then notifies the Registrar’s office of the nature, format and schedule for the exam. This information is then communicated to the student by the Registrar in writing with any further related instructions from the School. If the student wishes to proceed with the challenge exam as prescribed in the exam the student must sign the agreement in writing and to pay a non-refundable tuition fee equivalent in amount to the fee for one course credit for the semester in question.

7.2 Challenge Examinations Regulations

Receipt of payment of the applicant’s required tuition fee by the School, following written confirmation of the Challenge Exam availability from the Registrar, shall constitute an official request for a Challenge Examination. The applicant is then entitled to challenge the course in question for credit through the agreed upon examination.

• Challenge for Credit is available only to students formally admitted to the program in which he/she has already challenged.

• A maximum of five (5) credits towards a Marine Institute Diploma may be acquired by challenge exam at the Marine Institute or elsewhere. A maximum of two (2) credits may be obtained towards a Marine Institute Certificate.

• A challenge credit may not be used as a substitute for grade raising or to replace a failed course.

• The Challenge Examination shall be worth 100%.

• A student may not challenge a course (or its equivalent) in which he/she has been previously registered or which he/she has already challenged.

• The passing grade for a challenge will appear on the transcript as P, PAS, FAL or F. Challenge grades are not, therefore, computed in averages and are not used in evaluating scholarship standing, but are counted as course attempts. Failures (FA) will be noted on the transcript.

• A Challenge Examination is cancelled if the student has officially requested a Challenge Examination. Failure to complete the exam as approved will constitute failure of the course.

• Applications to write challenge examinations are to be filed in accordance with deadlines for Supplementary Exams. The Registrar shall notify the student of the status of the Challenge examination by way of a Challenge Exam Report and the final result will be included as part of the student’s end of semester grade report.

8. PROGRAM/COURSE REGISTRATION

The registration schedule for each semester or technical session, for each program, is set by the Registrar. For the Fall Semester, the registration period commences late July or early August. For the Winter Semester, registration commences in December. For Technical Session, the registration period is normally the two weeks preceding the first day of Technical Session. The dates for registration for each semester and start of classes are published each year in the Marine Institute Academic Diary.
The specific registration schedule for each program is published prior to the start of each semester or session and is posted or distributed to students.

Students are required to register before the published registration deadline. Students who do not register before the deadline may be denied permission to register. If in such a case, a student is permitted to register late, the student must pay a late registration fee. No student may register after the last date to officially add courses. Specific deadlines are listed separately under the regulations for course changes.

9. COURSE CHANGES

A student who wishes to officially drop or add a course prior to the official add or drop date can do so online through the student self service website at https://www5.mun.ca/admit/tdkwlstd.P_WWWLogin. A student who wishes to drop or add a course after the official add or drop date must obtain and complete an official Course Change Form from the Office of the Registrar or the Institute’s Information Centre, complete the form and have each course change approved by his/her Program Chair and Head of School and return the Course Change Form to the Office of the Registrar for final approval. Any course changes outside the official dates of drop and add will be reviewed on a case by case basis and only approved in exceptional circumstances.

9.1 Term or Semester

The official date for adding courses is TWO WEEKS from the first day of classes in a semester.

The official deadline for dropping courses is SIX WEEKS from the first day of classes in a semester. For students in Primary Technology in the Fall Semester, in their first semester at the Institute, the deadline for dropping courses is EIGHT WEEKS from the first day of classes.

9.2 Technical Session

In a Technical Session, the official deadline to add courses is the end of the FIRST DAY of classes. Courses may be added beyond this deadline only with the written permission of the School Head and the Registrar.

In a Technical Session, the official deadline for dropping courses is the end of the TENTH DAY of classes for courses which are of length of time to students to add applicable courses.

Length of Course: 32

Deadline for Dropping Courses: 33

End of Second day of Classes

End of Fourth day of Classes

End of Sixth day of Classes

End of Eighth day of Classes

NOTE:

For students in Transport Canada approved programs, minimum attendance requirements apply which may reduce the length of time available to students to add applicable courses.

10. CLASSIFICATION OF STUDENTS

10.1 Full-Time Student

The full-time course load in a Semester for a diploma or certificate student is four or more courses. A student registered for four or more courses in a Semester shall be considered to be registered as a full-time student.

The full-time course load in a Technical Session for a diploma student is considered to be two or more courses when that student is registered in a Program for which the normal course load for the respective Technical Session is three or more courses.

Students registered for two or more courses in a Technical Session in such cases shall be considered to be registered as a full-time student for that Session.

For students registered in a Technical Session for a diploma program for which the normal course load of the Institute is two courses, the students shall be considered to be registered as a full-time student when registered for one course in that session.

10.2 Part-Time Student

A student registered for three or fewer courses in a Semester shall be considered to be registered as a Part-time student for that semester.

Students registered for one course in a Technical Session for which the normal course load is three or more courses shall be considered to be registered as a Part-time student for that semester.

10.3 Other Requirements

Students should note that external sponsoring agencies such as Human Resources Skills Development Canada and Canada Student Aid may have requirements for the students they sponsor to be in attendance for a minimum number of hours per week and/or to be enrolled for a minimum number of weeks while they are sponsored. Students are responsible for ensuring that they are familiar with the sponsor’s requirements before they register and that they meet the minimum standards of attendance of the sponsoring agency.

11. PROGRESSION IN A PROGRAM

Courses are generally studied as they appear in the program outline. By following the outline, students should be able to complete their program in the shortest possible time. In all instances, less than 21 days in length, for prerequisite and co-requisite courses must be satisfied. The official program and course outlines contain information regarding such requirements. In evaluating a student’s final standing, the work of the entire semester will be taken into consideration. This includes semester examinations, class tests, laboratory work, technical work, reports together with attendance.

11.1 Program Changes

Changes in regulations governing programs may be made from time to time. Students who have not interrupted their program may complete their requirements for graduation following the regulations in place when he/she started his/her program. Students who have interrupted their program may be required to complete additional courses so that they may meet program requirements under the new regulations.

12. ADMISSION AND CONTINUANCE

Subject to the admission regulations described in the following paragraphs, a student enrolled in a certificate or an advanced technology, or technician diploma program, and registered as a full-time student, shall be permitted to continue to the next semester if he/she passes all 50% of the courses for which a grade is awarded that semester. If he/she passes fewer than 50% of the courses for which a grade is awarded that semester he/she will be required to Withdraw (WD).

Students are required to maintain a cumulative average of 65% at the end of each semester of study. A student who passes 50% of the courses for which a grade was awarded in a semester, but has one or more failures and has a cumulative average of at least 65% will be awarded a Clear Standing (GO) and will be readmitted to the following semester without conditions.

A student who has been admitted to the Semester with a Clear Standing (GO) and who has earned a cumulative average of between 50% and 59.9% at the end of a semester, and has passed 50% of the courses for which grade was awarded in the semester, will earn a Conditional (CR) standing and will be conditionally readmitted to the next semester. If, at the end of the next semester, the student again passes 50% of the courses for which a grade was awarded and earns a cumulative average of between 50% and 59.9%, the student will be required to Withdraw (R1) from the Marine Institute for a minimum of one full semester.

Students who have a cumulative average below 50% will be required to Withdraw (R1) for a minimum of one semester. Technical or summer semester sessions do not constitute a Semester.

With the exception of students admitted to the Marine Institute with an advanced standing of 10 credits or more, a student in his or her first semester at the Marine Institute will be re-admitted to the second semester of study provided that he or she passes 50% of the courses for which a grade was awarded. First semester students who pass 50% of the courses who have a cumulative average of less than 60% will be re-admitted to the next semester with an Academic Warning (AW).

A student who has been withdrawn to Withdraw (R3) from the Marine Institute or any other public post-secondary institute, on a total of three (3) occasions will be academically dismissed. In this instance a student may be re-admitted to the Marine Institute only in exceptional circumstances and only upon approval of an Admissions Committee.

12.1 Readmission Following Withdrawal

Subject to the information above students who withdraw voluntarily or are required to withdraw (R1, R2, R3) for academic or disciplinary reasons are required to reapply for admission to the Institute as per the Admissions policies and procedures.

13. DROPPING COURSES

13.1 General Information

• Specific deadlines for dropping courses in any semester or session are stated in the Marine Institute Diary. In the case of Technical Sessions and courses offered outside the regular timeframe of a semester or session, deadlines for dropping courses without academic prejudice will be prorated accordingly.

• No course will be considered to have been dropped until the Registrar has received official notification and certified the drop.

• Ceasing to attend classes, or informing an instructor of the intent to drop a course, does not constitute an official dropping of a course.

• A student who drops all courses in any given semester will be considered to have withdrawn from the Marine Institute for that semester. A student who has withdrawn from the Institute before the start of classes in any semester, is deemed to be not registered for that semester. For information regarding applying for readmission to the Marine Institute refer to Readmission section of the Calendar.

• In the event that a student drops a co-requisite course, the student will be required to drop the course for which that course is a co-requisite.

• Before the end of the registration period a student may, upon formal notification to the Registrar, change the course(s) for which he or she was originally registered by adding and/or dropping a course(s).

13.2 Dropping Courses Without Academic Prejudice

• Until the end of the second week following the first day of lectures in any semester, a student may, upon formal notification to the Registrar, drop a course without academic prejudice. A student who has withdrawn from the Institute before the start of classes in any semester, is deemed to be not registered for that semester. For information regarding applying for readmission to the Marine Institute refer to Readmission section of the Calendar.

• From the beginning of the third week to the end of the seventh week following the first day of lectures in any semester, a student may, upon formal notification to the Registrar, drop a course without academic prejudice. A grade of DR will be assigned in these circumstances and will be entered on the student’s record.

• From the beginning of the eighth week following the first day of lectures in any semester to the last day to add courses in the following semester, a student who is prevented from completing the requirements of a course by illness, bereavement, or other acceptable cause, duly authenticated in writing, may drop a course without academic prejudice. This may occur only with the approval of both the course instructor and the head of the academic unit of the student’s program. A grade of DR will be assigned in these circumstances and will be entered on the student’s record. Normally, once the final exam is written the course will be considered to be completed and no drop will be possible.
13.2.1 Dropping Courses Retroactively
An academic transcript is a complete and accurate reflection of a student’s academic record. On rare occasions, however, a student may request to drop a course beyond the last day to add courses in the semester following the one in which the course was taken. Courses dropped in this time frame are considered to be dropped retroactively and requests will only be considered for illness, bereavement, or other acceptable cause, duly authenticated. These would be unusual circumstances beyond the student’s control in cases where the course(s) was/were not completed. Normally, once the final exam is written the course will be considered to be completed and no retroactive drop will be possible. A poor grade is not, in and of itself, acceptable as a reason for dropping a course retroactively. A grade of DEX (Drop due to Exceptional Circumstances) will be assigned in these circumstances and will be entered on the student’s record. Requests shall be submitted to the Office of the Registrar no later than five years following the last day of examinations for the semester in which the course was taken. Requests should include the following information:
- Name,
- Current address and telephone number,
- Email address,
- Student ID number,
- Courses(s) requesting to drop retroactively,
- Explanation of why course(s) could not be dropped during regular timeframe,
- Grounds for the request,
- Supporting Documentation,
- Documentation from the course instructor regarding grading scheme and final grade.

13.3 Tuition Fee Implications
A student who drops all courses in any given semester will not be registered for that semester, is deemed to be not registered for that semester.

13.4 Withdrawal from the Marine Institute Without Academic Prejudice
Until the end of the second week following the first day of lectures in any semester as stated in the Marine Institute diary, a student may, upon formal notification to the Registrar, withdraw from the Institute without academic prejudice. Courses dropped under these circumstances will not be entered on his/her record.
From the beginning of the third week to the end of the seventh week following the first day of lectures in any semester as stated in the Marine Institute diary, a student may, upon formal notification to the Registrar, withdraw from the Institute without academic prejudice. The letter grade DR will be assigned to all courses in these circumstances.
From the beginning of the eighth week following the first day of lectures in any semester to the last day to add courses in the following semester as stated in the Marine Institute diary, a student is considered to have completed the semester by illness, bereavement, or other acceptable cause, duly authenticated. These would be unusual circumstances beyond the student’s control in cases where the course(s) was/were not completed. Normally, once the final exam is written the course will be considered to be completed and no retroactive withdrawal will be possible. Poor grades are not, in and of themselves, acceptable as a reason for withdrawing retroactively. A grade of DEX (Drop due to Exceptional Circumstances) will be assigned in these circumstances and will be entered on the student’s record. Requests shall be submitted to the Office of the Registrar no later than five years following the last day of examinations for the semester in which the course was taken. Requests should include the following information:
- Name,
- Current address and telephone number,
- Email address,
- Student ID number,
- Courses(s) requesting to withdraw retroactively,
- Explanation of why course(s) could not be dropped during regular timeframe,
- Grounds for the request,
- Supporting Documentation,
- Documentation from the course instructor regarding grading scheme and final grade.

15. REPORTING PERFORMANCE
15.1 Grade Reports
Semester grade reports are released via student self-service at the end of each semester for all Advanced, Technology and Technician Diploma and Certificate Programs. These list the courses taken during that semester and the grades or results obtained by one of the letter codes below. This also reports the end of semester academic standing earned by the student at the end of the period of study. The following provides an explanation of grades reported at the end of each semester or session:
- A Numeric Grade indicates the grade received.
- A Grade of F indicates that the student dropped the course without academic prejudice. No grade is recorded.
- ADR indicates that the student dropped the course but has incurred academic prejudice. A grade of 0% is recorded.
- G0, G1, G2, or a Numerical Grade indicates the grade received.
- ADRF indicates that the student dropped the course but has incurred academic prejudice. A grade of 0% is recorded.
- PAS indicates that the student’s performance meets expectations but no numeric grade is recorded. The student has passed at least 50% of all the courses for which the student is registered. (The # indicates the number of withdrawals)
- A grade of AEG (Aegrotat) (AE) will be awarded to a student who has:
  - encountered exceptional circumstances such as sickness which prevented completion of the semester’s work;
  - demonstrated through his/her work that he/she has the ability to do the work;
  - received the recommendation of the School Head.

15.2 Aegrotat (AEG)
Aegrotat status in a course refers to a student’s eligibility to continue in his/her program without completion of all semester work. The student may, with advancement to subsequent courses on the basis of the work completed. Aegrotat confers credit for the course(s) under consideration.

15.3 Audit
An auditor is a student who is awarded permission, in writing by the School, to attend lectures in a course on the understanding that he/she may not participate in any assignements, examinations or any other form of evaluation offered for the course involved. Such a student will not be permitted upon seat availability in the course and the satisfaction of the instructor of the course that having a student audit the course will not be a disruption for him/ her or the remainder of the class.

15.4 Deferred Final Examinations (DEF)
A student who is unable, for a valid reason, to write a final examination at the scheduled time may apply for a Deferred Examination. The application must be supported by a detailed medical certificate if the absence is due to illness or hospitalization.
If a student becomes ill or receives notification of severe domestic affliction during an examination, and wishes to discontinue the examination and apply for a deferral, he/she shall report at once to the chief invigilator, hand in his/her unfinished examination and request the exam be cancelled. If illness is the cause, he/she must report directly to a physician so that any subsequent application for a deferred examination may be supported by a medical certificate.
If a student writes an examination, submits his/her paper for marking, and later reports extenuating circumstances to support his/her request for cancellation of his/her paper, such a request will not be considered.

15.5 Repeats
Students are permitted a maximum of three attempts at each course for which a grade is awarded by the Institute. Thus a student is permitted a maximum of two repeats for each course on his/her record.

15.6 Part Time
A student is considered part time who is taking three or fewer courses in a semester.

15.7 End of Term Academic Status
At the end of each semester a student’s end of term academic standing shall be denoted on a student’s grade report or transcript with one of the following:
- A grade of AEG will be awarded to a student who has:
  - encountered exceptional circumstances such as illness which prevented completion of the semester’s work;
  - demonstrated through his/her work that he/she has the ability to do the work;
  - received the recommendation of the School Head.

15.8 Clear Standing (G0, G1, G2)
The student has passed at least 50% of all the courses for which a grade was awarded and has a cumulative average of at least 60% (The # indicates the number of withdrawals).

15.9 Academic Warning (AW)
This standing applies to one time first semester students only. The student has passed 50% of the courses for which a grade was awarded, but has a cumulative average of less than 60%.

15.10 Conditional (CR, C1, C2)
The student passed 50% of the courses for which a grade was awarded and has a cumulative average between 50% to 59.9%, except in the case where these conditions were met in the previous semester and the student was admitted to the current semester as a full time student. A student is required to withdraw with the exception of technical session and workterms.
15.7.4 Withdrawal (R1, R2, R3) A student who, in a given semester, meets the requirements for conditional standing but who earned a Conditional Standing for his/her previous academic semester is required to withdraw for one semester. If the requirements for Conditional Standing are met as a result of grades earned during the Technical Session and the student earned a Conditional Standing in the previous semester, the student will be awarded a Conditional Standing and will be conditionally readmitted to the next semester or session. A student who passes fewer than 50% of the courses for which he/she registered in a semester will be required to withdraw for one semester with the exception of Marine Engineering Term 6 Academic summer semester. Technical or Summer sessions do not constitute a Semester. A full time student whose cumulative average is less than 50% is required to withdraw for one semester.

15.7.5 Academic Dismissal (R3) A student who has been required to withdraw from this or any other public post-secondary Institution on three (3) occasions will be Academically Dismissed. In this instance, a student may be readmitted to the Marine Institute only in exceptional circumstances and only upon approval of the Admissions Committee.

16. TRANSCRIPTS A transcript of a student’s academic record is available online by accessing the Student Web, or by contacting the Marine Institute Office of the Registrar. No transcript will be issued while the student is financially indebted to the Institute.

17. EXAMINATIONS Dates of final and supplementary examinations will be set in advance. No more than two final examinations will be scheduled for a student on any one exam day. In the event that a student is scheduled for more than two final examinations in one day then they can apply for a deferred exam. The method of evaluation is set out in the Official Course Description. Instructors shall not be permitted to give tests or quizzes worth more than 10% of the total final mark in the two week period prior to the start of semester examinations. As well no previously unassigned work may be assigned in the last two weeks of the semester. This regulation does not apply to:

- Courses with no final semester examination.
- Laboratory examinations.
- Assignments given prior to this period which are due in the two weeks prior to examinations.
- Courses offered in the Technical Session.

18. EXAMINATION RE-READS Any student may apply to have a final examination re-read, whether or not he/she has passed the course. The application must be made in writing to the Registrar within one month after the student has been officially informed of the result of the examination(s). The appropriate fee must accompany the application. The fee will be refunded if the student's grade is raised once the final examination is re-read. If the grade remains the same or is lowered, the fee is not refundable. If the student's grade is changed as the result of a re-read, the revised grade will replace the original result on the student's record and will be denoted on the transcript except in the case where the original grade was a passing grade and a re-read results in a failing grade. In such instances, the original grade will remain on the student's record.


- The privilege of writing supplementary examinations is limited to students who:
  - have failed no more than two subjects;
  - have obtained at least 90% of the specified passing grade in each subject failed;
  - have obtained a term or session average of at least 55%;
  - are registered on a full-time basis for the period of study in question.
- Only one attempt to write a supplementary examination will be permitted in each subject allowed under these regulations.
- Students seeking to write supplementary examinations must apply to the course in which they failed in order to earn credit for these courses. Once a student has written the maximum supplementary examinations allowed in their program, he/she must repeat any failed courses in order to earn credit for these courses.
- Any student who has failed to complete laboratory work, workshop or drawing work to the satisfaction of the School, is ineligible for supplementary examinations.
- Applications to write supplementary examinations are to be filed at the Registrar’s Office no later than five (5) business days after the release of grades by the Registrar’s Office, with the exception of the Fire Rescue Program. The date of the official release of grades for this purpose is the day that grades are released via student self-service (Web).
- Applications to write supplementary examinations for students in the Fire Rescue program must be received within two (2) days of notification of exam results, and supplementary exams must be written within seven (7) days of the original exam.
- The prescribed fee must accompany the application, which is not refundable.
- Supplementary examinations will be written before or at the beginning of the next academic semester or session.
- For examinations written in April, supplementary exams will be scheduled in April or May.
- For examinations written in May, supplementary exams will be scheduled in June or September.
- For examinations written in December, supplementary examinations will be scheduled in January.
- Supplementary exams must be written during the exam period scheduled for the course in question. The application for a supplementary exam must be filed within the normal application period as specified above.
- For students permitted and scheduled to write a supplementary examination, failure to write a scheduled supplementary examination without prior written notice satisfactory to the Registrar, will result in a grade of 0% for the exam portion of the course.
- A Supplementary exam cannot be written for a course in which a student has received a reduction of any portion of the course grade as a result of Academic Misconduct.
- For the purposes of calculating a student's final grade, the highest grade earned in a supplementary examination replaces the grade earned for the original examination for the calculation of the final course mark.
- The maximum grade for a course in which a supplementary examination has been written is the passing grade for the course.

20. WAIVER OF PROGRAM REGULATIONS Every student also has the right to request a waiver of their program regulations.

- The Marine Institute reserves the right in special circumstances to modify, alter, or waive any Marine Institute regulations or its application to individual students where merit and equity so warrant, in the judgement of the Committee on Undergraduate Studies of the Marine Institute.
- Students requesting a waiver of a Marine Institute program regulation must submit their request in writing to the head of the program who will forward a recommendation to the Chair of the Committee on Undergraduate Studies of the Marine Institute. Medical and/or other documentation to substantiate the request must be provided.
- No waiver granted may reduce the total number of courses required for the certificate/diploma.

21. GRADUATION The Marine Institute holds its annual graduation ceremony each year in June for all students graduating from advanced diploma, technology diploma, technician diploma and certificate programs. Students required to meet program requirements and expecting to graduate from the Marine Institute must submit an Application to Graduate to the Office of the Registrar by the published deadline. Candidates must meet the following requirements in order to be approved by the Marine Institute Academic Council to graduate from the Marine Institute:

- A minimum cumulative average of 60%.
- Have passed all courses in his/her program.
- Have obtained a minimum of 50% of the credits for their program at the Marine Institute.

22. APPEALS POLICY AND PROCEDURES The Appeals Committee of the Marine Institute Academic Council provides an objective review of students’ cases. The Committee considers student appeals of the application of the Marine Institute Academic Policies and Regulations.

- The purpose of this section is to outline the procedures by which appeals may be made and to ensure that students are given advice that will allow them to make the best possible case when preparing an appeal.
- The responsibility for making an appeal before the Appeals Committee of Academic Council rests with the student.
- Student Appeals should be directed in writing to the Registrar who is Chair of the Academic Council Appeals Committee.
- Reasons for initiating an appeal before the Appeals Committee of Academic Council include the following:
  i) medical problems
  ii) bereavement
  iii) other acceptable cause
- Students should prepare as strong a case as possible. It is therefore recommended that students seek advice when preparing their appeal. Such advice can be obtained from a variety of sources:
  i) The Office of the Registrar for the appropriate regulations and appeal procedures.
  ii) An advisor or facilitator to assist in preparing their appeals.
  iii) A faculty member
  iv) A counselor
  v) Designated faculty, who have made themselves familiar with the appeals process and who are willing to undertake the role of student advisor or facilitator.
- The Marine Institute Student Union (MISU) may also assist students who are not able to consult with an advisor or facilitator.

A student submitting an appeal must present to the committee a personal letter including reasons for the appeal. Students must present evidence to corroborate statements made in the letter of appeal. Preferably, this evidence will come from a professional, such as a doctor, a counselor, a lawyer or a professor. However letters from other knowledgeable parties may be acceptable.

- In cases where an appeal is made on medical grounds, medical notes must be sufficiently specific to allow appropriate consideration of the student's case. The note must also clearly state that, in the opinion of the doctor, the problem was serious enough to have interfered with the student's work. The Institute requires that all medical notes be on letterhead, be signed by the physician and include details on the following:
  i) confirmation of the specific dates on which the student visited the doctor.
  ii) the degree to which the illness (or treatment, in the case of medication, for example) is likely to have affected the student's ability to study, attend classes, or sit for examinations.
  iii) the length of time over which the student's ability was likely hampered by the medical condition (e.g. recurring and
ACADEMIC POLICIES AND REGULATIONS

23. ACADEMIC MISCONDUCT

These rules on Academic Misconduct apply to students registered in courses in any non-degree Marine Institute program. Students enrolled in the degree-level courses should consult the Memorial University Calendar for regulations governing undergraduate and graduate degree students.

23.1 General Procedures

23.1.1 Reporting Offenses:
The Marine Institute values academic honesty highly. When any member of the Marine Institute community (faculty, staff, student) has reason to believe that an academic offense has been committed, he/she is obliged to report the matter verbally without delay to the appropriate person immediately.

In the case of a final examination, the appropriate person shall be the chief invigilator. In the case of a classroom test, assignment, project, or other academic work, the appropriate person shall be the person for whom the work is being done or the person supervising the work. The person for whom the work is being done shall take immediate action to stop the offense, if possible. He/She shall promptly inform the student’s School Head of the offense and the action taken.

In the case of a final examination, the report shall be made to the Supervisor of Examinations who will prepare a report to the appropriate School Head once the circumstances of the matter have been determined. A verbal report shall be confirmed in writing as soon as possible.

All references to School Head in this policy refer to the Head of the School with responsibility for the program of study in which the student accused of academic misconduct is registered.

23.1.2 Resolution of Allegations:

1. In the case of work, other than final exams, which constitutes less than 10% of the final grade for the course in question, an instructor may determine that a student may be guilty of either cheating or plagiarism. Such an offense shall be considered a minor offense.

In such cases, an instructor may apply a grade reduction penalty up to and including the reduction of the grade for the portion of work in question to 0%. In such cases, the instructor shall submit a brief written report to the School Head documenting the nature of the incident, the evidence used to determine that the student cheated, and the action taken to resolve the issue. For minor offenses, an instructor may choose to have such incidents of alleged academic misconduct resolved by the student’s School Head.

2. The School Head shall interview each person involved separately to establish the facts of the matter and the appropriate steps to follow. Those to be interviewed shall include the student(s) in question, the instructor for the course in question, the witness to the act of academic misconduct, and, in the case of final examinations, the Chief Invigilator and the Supervisor of Examinations. All interviews and review of all documentation shall be completed and a decision shall be made by the School Head within ten (10) business days of the occurrence of the alleged offense.

3. If upon completion of step 2 above the School Head determines that there is not enough evidence to determine that a student is guilty of an act of academic misconduct, the matter is resolved and the student and instructor are notified in writing of the outcome.

4. If, upon completion of step 2 above, the School Head determines that there is enough evidence to determine that an act of academic misconduct was committed by a student, he or she will assess the circumstances and severity of the act of dishonesty and apply the appropriate penalties, as outlined below in the section concerning Penalties. The School Head shall notify the student in writing of the outcome of the case within five (5) business days of his/her decision.

23.2 Academic Offenses

Students who commit acts of academic misconduct, including but not limited to the following offenses, shall be subject to disciplinary action by the Marine Institute.

23.2.1 Cheating:

For assignment, tests, projects, reports, laboratories and examinations cheating means copying from another student’s work, or allowing a student to copy from one’s own work; consulting with unauthorized persons during a test or examination; or using unauthorized notes, books, manuals, or equipment during a test or examination.

Impersonating Another Student or Allowing Oneself to be Impersonated:

Impersonation for these purposes means the imitation or substitution of one person for another for the purposes of writing an examination or undertaking other academic work.

23.2.2 Plagiarism:

Plagiarism is the act of presenting the ideas or works of another as one’s own. Under copyright law in Canada, all such items (writings, photos, videos, handwritten notes, etc.) are the property of the originator, even if not formally inscribed with the copyright symbol. This applies to all material such as essays, laboratory reports, term papers, design projects, seminar presentations, statistical data, computer programs and research results. The properly acknowledged use of sources is an accepted and important part of scholarship. Use of such material without acknowledgment, however, is contrary to accepted norms of academic behavior.

23.3 Penalties for Academic Misconduct Offences

Penalties resulting from acts of academic misconduct, as previously defined, may be taken from the full range of penalties available including reprimand, probation, grade reduction, suspension or expulsion. A description of each form of penalty can be found below. However, conviction for certain offenses shall automatically invoke penalties as follows:

OFFENSE PENALTY
Thief of academic materials. Expulsion
Possession, use, and/or distribution of stolen academic material. Expulsion
Giving false information to gain entrance to the Institute. Expulsion
Impersonation Reduction of Grade
Any other case of academic misconduct relating to a test, assignment, lab semester period, or semester report, which constitutes 10% of more of the final course grade. Reduction of Grade, Probation and/or Suspension
Any other case of academic misconduct relating to a final examination Reduction of Grade and Suspension
Any other case of academic misconduct relating to two or more final examinations Reduction of Grade and Suspension

23.3.1 Submitting False Information:

Submitting false information includes, but is not limited to, the submission of false data, medical records, credentials, and misleading or incomplete information.

23.3.2 Submission of the Same Material for Two or More Courses:

This refers to submitting work for one course or work term which has been, or is being, submitted for another course or work term at this or any other institution without express permission to do so.

23.2.3 Theft of Academic Materials:

Thief means the obtaining or possession of, by any improper means, examination papers, tests, or any other materials used in the evaluation of students.

23.2.4 Use and/or Distribution of Stolen Materials:

This refers to the use and/or distribution of materials which the student knows have been improperly obtained.

The student shall be given a period of two weeks from the date of receiving the letter in which to make an appeal before the Executive Director’s final decision is made.
The Registrar shall be responsible for the enforcement of A student who has been found guilty of academic misconduct of the recommendation for expulsion. The recommendation for expulsion shall be made to the Institute. Students who have been expelled shall not be 23.4.5 Expulsion:
In no case shall the length of the suspension for any single A suspension may apply to a course, program, or the Institute. A student who commits a second offense while under probation and shall be conveyed to the student in writing by the Chair of A student who commits a second offense while under probation may be suspended or expelled upon the recommendation of the recommendation for expulsion or Probation. The onus is on the student to ensure that the entry is removed at the appropriate time. 23.7 Disposition of Documentation:
Documents relating to allegations under these procedures shall 23.7.1 Allegations Not Supported:
In cases where the allegation was not supported, no documentation shall be retained. 23.7.2 Allegations Supported and Resolved by Instructor:
In cases where a minor offense is resolved by an instructor, documentation relating the incident shall remain with the School Head. Documentation of the offence may be reported to the Registrar. This shall not be recorded in a student’s file or on a student’s transcript. It will be used to apply the appropriate scholarship or supplementary examination regulations for the term in which the offense was committed. 23.7.3 Allegations Supported and Resolved by School Head:
In cases where the allegation is supported and resolved by the School Head documentation regarding the incident shall remain with the School Head. In such cases, the School Head shall initiate action as per step 2 above under “Resolution of Offenses”. 23.7.5 Transcript Entries:
Transcript entries related to the penalty(ies) imposed shall be as follows: PENALTY ENTRY
Reprimand No entry.
Reduction of Grade Final grade for course.
Probation On probation at the Institute for academic misconduct until Day, Month, Year. * Suspension Suspended from course/program/ Institute for academic misconduct until Day, Month, Year. * Expulsion Expelled from the Institute for academic misconduct.
* These entries are removed upon the expiry of the period of Probation or Suspension. The onus is on the student to ensure that the entry is removed at the appropriate time.

4. GENERAL GUIDELINES FOR FORMAL WORK TERMS:
The Marine Institute offers a number of programs which include formalized work terms which are required in order to successfully complete the program of study and be eligible for the related diploma or certificate. The Institute has general guidelines governing work terms which are provided below. There are also work term regulations specific to each program. These are considered as course regulations which are provided to students separately.

24.4 Placement Services and Coordination
All placements for work terms are coordinated jointly through the appropriate School before accepting a work term position with the intention of fulfilling the work term requirements of any specific program. Failure to receive prior approval may jeopardize the student’s standing and eligibility of the work term. Placement services shall not place the student until he/she has been reinstated in the program. Students in School of Fisheries programs and School of Ocean Technology Programs, who are unable to secure a work term placement are required to do a research project. The project must be approved by the School Head and supervised by a faculty member. A research project is not an option for students in any other School of Maritime Studies programs.

24.5 Evaluation
All students on work terms are required to complete a project as specified by the respective School. Written project reports or completed “Sea Training Manuals” must be submitted to the appropriate Program Chair prior to the registration date for the next academic semester. These reports and manuals are evaluated by the Program Chair or designate.

Evaluation of a students work term performance is based on the employment report and/or the written project report or the Sea Training Manual. Each is evaluated separately. The specific evaluation scheme for each work term is outlined in the course regulations for that work term. On-the-job performance is assessed by written documentation from the employer and, where necessary, a meeting between the employer and the student.

24.6 Advancement
Students are required to obtain a minimum overall passing average as specified by the appropriate School and the requirements of each respective work term. However, in all cases, a student must obtain no less than 50% in each of the appropriate evaluation components (Sea Training Manual, project report, employer’s assessment) in order to advance. Students who fail to complete work, leave before the agreed upon termination date, or perform in a manner which causes the
employer to terminate employment, shall be deemed to have failed the work term.

24.7 Repeating Work Terms

Students who do not achieve the required grades, or fail a work term for any reason, are required to repeat the work term in order to earn credit for that component of the program. A student is permitted to repeat a given work term only once. Failure to pass on the second attempt means that the student must then withdraw from the program. A student may not repeat more than one work term for the entire length of the program.

Students who fail a work term are required to withdraw from the Marine Institute for at least one academic semester. The period of withdrawal will be considered to be the academic semester immediately following the scheduled date of return to the Institute following the work term.

24.8 Reporting of Results

Work Term evaluation results are recorded as either Pass (PAS), Pass with Distinction (PWD) or Fail (FAL) on the student’s transcript. No grade value is recorded on a student’s transcript.

24.9 Scheduling

Work terms are scheduled differently for each program. Students are expected to complete the work term(s) at the appropriate time(s). Alterations to the schedule or exemptions can be made only on the basis of exceptional circumstances and with approval from the School. All requests for exemptions or alternatives along with supporting documentation (medical forms, etc.) must be submitted in writing to the Registrar.

24.10 Specific Programs

For information on the application of these general regulations to specific programs, please consult the detailed program listings.
A number of privately run centres are located throughout the city and may be conveniently located for some students. Further information is available from www.gov.nl.ca/cyfs/childcare.

COMPUTER FACILITIES/RESOURCES

The Marine Institute provides computer laboratories to be used for instruction, course work and assignments. These facilities are fully net worked and permit students to operate all software applications required for their course work. These rooms are available during normal working hours when classes are not in progress as well as at scheduled times after hours. Printing and plotting is provided on a fee per page basis, funds are transferred to the printing software using the Smart Card system.

Accounts are issued to new students at the beginning of each semester. Returning students will have their accounts renewed upon confirmation of registration. Please see University Single Email for students and Employees policy at http://www.mun.ca/policy/site/view/index.php?Single E-Mail for Students and Employees for further information.

While using these facilities, students are expected to adhere to the regulations governing computer facility usage for all individuals accessing Marine Institute computer systems and services. The regulations are provided in the Calendar section Institute Rules under Academic Policies and Regulations. Failure to do so may result in a loss of privileges or further disciplinary action in accordance to the Code of Disciplinary Procedures for Students. Violations of some policies may constitute a criminal offence.

FOOD SERVICES

The Marine Institute’s Cafeteria is located on the lower level offering a panoramic view of the city of St. John’s.

The Cafeteria operates year round, offering a full complement of homemade foods at affordable prices. There is a four-week rotating menu consisting of a variety of homemade soups, salads, sandwiches, and hot meals. The Cafeteria also features new additions each semester with a focus on quality nutritious meals enjoyed by students and employees.

Hours of Operation

Monday – Thursday: 8:00 am – 4:00 pm
Friday: 8:00 am – 2:30 pm

CHILD CARE

The Institute does not have its own child care centre. The University operated a child care facility located next to Burton’s Pond on the St. John’s campus. Further information is available from the centre.

Campus Childcare Inc.
Memorial University of Newfoundland
St. John’s, NL
A1C 5S7

Contact: Tracy Rose
Executive Director
Tel: 864-4728
Fax: 864-2693
www.mun.ca/childcare
E-mail: childcare@mun.ca

A number of privately run centres are located throughout the city and may be conveniently located for some students. Further information is available from www.gov.nl.ca/cyfs/childcare.
There are two health and dental plans for students, one for Canadian students and the other for international students. Students are normally covered under one or the other plan but not both.

The Marine Institute Students’ Union (MISU) offers students a health care plan which covers a portion of the cost of prescription drugs, dental services, eyeglass expense and other medical services. Participation in the plan is compulsory and fees are due at the time of registration. A family plan is available on request. A detailed description of the plans is available from the Student Council.

Students who are covered under a similar plan held by a parent or spouse may opt out of the plan by visiting the website at http://studentplans.ca/18. The opt out deadline for any given academic term is two weeks after the first day of lectures.

Canadian Students
The Marine Institute students may in residence on Memorial’s main campus or at the Dr. C.R. Barrett Library, located on the main floor of the Fisheries and Marine Institute. It offers a comprehensive range of research material to students, faculty, and staff at the Fisheries and Marine Institute and the Engineering Technology Centre of the College of the North Atlantic, and to the Newfoundland marine industries.

The library collection supports study and research in Fisheries and aquaculture, marine technologies, nautical science, and the ocean environment. The collection includes significant holdings in engineering technology.

The Dr. C.R. Barrett Library homepage http://www.library.mun.ca/ml/index.php provides access to all library and electronic books, journals, media based materials and library research resources and services available to the Memorial University community. Also available are Marine Topics web pages where library staff has aligned library resources to Marine Institute programs of study and research centres.

Library staff are available for consultation either in-person or via the chat feature located on the library home page.

LOCKERS
Lockers are available to students at a cost of $20.00 per year. At the end of the school year students are required to return their locks at which time they will receive a $10.00 refund. Failure to return locks will result in loss of the $10.00 refundable deposit.

Lockers are available in the Bookstore. Information about these activities is available from the Health and Wellness Coordinator.

There is a wide variety of intramural activities for both students and staff. These activities include softball, floor hockey, basketball and volleyball. Information about these activities is available from the Health and Wellness Coordinator.

The processing of changes of address for students.
• The evaluation of deferred and supplementary examination applications.
• The coordination and supervision of final examinations including deferred and supplementary examinations.
• The receipt and coordination of challenge examination applications.
• The coordination of the review of, and response to, student academic appeals.
• The coordination of the Institute’s response to reports of academic misconduct.
• The coordination of enrollment for Transport Canada certification training.
• The receipt, processing and reporting of end of term grades.
• The provision of official student transcripts.
• The receipt and evaluation of applications for graduation.
• The provision of student certificates and diplomas upon verification of completion of program requirements. The Office of the Registrar may be contacted for further information on programs or any of the above services as follows:

Phone: (709) 778-0488 or 1-800-563-5799 (ext. 488)
Fax: (709) 778-0322
E-mail: admissions@mi.mun.ca
Web Site: www.mi.mun.ca


PARKING
Students who wish to park on campus must obtain a parking permit. Parking permits will be sold during registration and may be purchased after registration at the Cashier's Office. All students must complete an Application for Parking Permit form which is available on line. Memorial University parking regulations apply to the Institute and students are advised to obtain a copy from Security or Marine and Technical Services. Tickets are issued for traffic and parking violations and must be paid at the Provincial Traffic Court.

RECREATION AND FITNESS
A large, well-equipped, modern gymnasium, exercise room, weight room, change and shower rooms are available for physical and recreational activities.

There is a wide variety of intramural activities for both students and staff. These activities include softball, floor hockey, basketball and volleyball.

Information about these activities is available from the Health and Wellness Coordinator.

The following policies and procedures apply to the recreational facilities:
• Only non-marking shoes will be permitted on gym floor.
• Equipment must be returned to office when group is finished.
• Any abuse of facility or equipment will not be tolerated.
• Student I.D. must be presented in order to use facility equipment.

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Phone: (709) 778-0488 or 1-800-563-5799 (ext. 488)
Fax: (709) 778-0322
E-mail: admissions@mi.mun.ca
Web Site: www.mi.mun.ca


PARKING
Students who wish to park on campus must obtain a parking permit. Parking permits will be sold during registration and may be purchased after registration at the Cashier’s Office. All students must complete an Application for Parking Permit form which is available on line. Memorial University parking regulations apply to the Institute and students are advised to obtain a copy from Security or Marine and Technical Services. Tickets are issued for traffic and parking violations and must be paid at the Provincial Traffic Court.

RECREATION AND FITNESS
A large, well-equipped, modern gymnasium, exercise room, weight room, change and shower rooms are available for physical and recreational activities.

There is a wide variety of intramural activities for both students and staff. These activities include softball, floor hockey, basketball and volleyball.

Information about these activities is available from the Health and Wellness Coordinator.

The following policies and procedures apply to the recreational facilities:
• Only non-marking shoes will be permitted on gym floor.
• Equipment must be returned to office when group is finished.
• Any abuse of facility or equipment will not be tolerated.
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ABC'S OF ON-CAMPUS SERVICES

STUDENT UNION
The Marine Institute Students’ Union (MISU) was incorporated in 1991. It is committed to the provision of services to students as well as representing the student body at the national, provincial and institute levels in matters affecting the quality of student life. The MISU is a prominent member of The Canadian Federation of Students (CFS). The CFS provides a voice for students at over 70 universities, colleges, and technical institutes across Canada including more than 32,000 students in Newfoundland and Labrador. The national body has a strong presence in Ottawa and ensures students’ opinions are known on Parliament Hill. Services provided by CFS include the National Student Health Network, student s aver cards, Student Work Abroad Program (SWAP), International Student Identity Cards (ISIC), and Travel Costs. The CFS Newfoundland and Labrador (CFS-NL) ensures student’s opinions are known in the Provincial House of Assembly. The MISU takes part in the CFS bi-annual conferences to discuss and form policies on behalf of students.

Within the Institute, the MISU has representation on a number of committees, including the Marine Institute Industry Advisory committee and the Academic Council, where the Union members ensure that student well-being is at the forefront in all policies affecting student life. The MISU provides the student health plan. Many social and recreational activities are planned and sponsored by the MISU including Winter Carnival held during the last week of January. Profits from the social activities are returned to the students in the form of scholarships. The MISU manages and maintains the student lounge - The Mariner’s

Elections for the Student Union Council are held during the year. All students are encouraged to become involved by running for a position and voting in the elections. Council members receive an honorarium for their involvement.

TRANSPORTATION

Bus
The Institute is on several regular Metbus routes. Special busses run in the early morning and late afternoon to facilitate students getting to and from classes. There is also an evening bus service. Schedules for the current term are posted near the main entrance of the Ridge Road Campus.

Fees and charges indicated herein are as of the date of printing. The Marine Institute reserves the right to make changes to the regulations, fees and charges listed below. Any questions concerning fees and charges should be directed to the Marine Institute Cashier’s Office on Ridge Road in St. John’s.

Tuition Fees:
Tuition for Technician Diploma and Diploma of Technology programs for Canadian citizens is $173.00 per course to a maximum of $690.00 per term. International students are assessed a tuition fee of $519.00 per course to a maximum of $2070.00 per term.

Technical Session fees for Canadian students are $173.00 per course to a maximum of $345.00. For International students Technical Session fees are $519.00 to a maximum of $1035.00.

Students entering Joint Diploma of Technology / Bachelor of Technology degree programs (Ocean Mapping and Underwater Vehicles) will be assessed fees based on the program structure outlined in this calendar. Diploma level courses are assessed fees as per the paragraph above. Fees for Canadian citizens for undergraduate courses in the program are $225.00 per course + other applicable fees as listed in the Memorial University Academic Calendar. Please note that the tuition for MSTM 410 A/B is $1154.00 and is assessed upon registration for these courses in the final year of the programs. Fees for international students for undergraduate courses in the program are $880.00 per course + other applicable fees as listed in the Memorial University Academic Calendar. Please note that the tuition for MSTM 410 A/B is $1779.00 and is assessed upon registration for these courses in the final year of the programs.

Tuition for Advanced Diploma programs for Canadian citizens is $345.00 per course to a maximum of $1380.00 per term. International students are assessed a tuition fee of $690.00 per course to a maximum of $2760.00 per term.

Students entering work terms in Advanced Diplomas and Diplomas of Technology must pay a fee equivalent to the fee for one course upon registration for that work term. The exceptions include the Marine Engineering and Nautical Science work terms which are equivalent to two courses paid one time in the first work term.

Technical Session fees for Advanced Diploma Programs for Canadian students are $345.00 per course to a maximum of $690.00. For International Students, Technical Session Fees are $690 per course to a maximum of $1380.00.

Tuition fees for all other programs can be obtained from the Office of the Registrar. Students sponsored by Human Resources & Labour Employment (HRLE) should also contact the Registrar.

Sponsorship:
Students who will be in receipt of sponsorship by an employer, HRLE or any other agency are responsible for the payment to the Marine Institute of all related tuition and other fees in accordance with the fee payment policy. In cases where a sponsor wishes to be invoiced by the Marine Institute for tuition or other fees, written notification must be provided from the sponsor on or before the day that fees are due to be paid. Such notification must state which fees, and to what amount, will be paid on the students behalf.

Laboratory Fee:
First year students are required to pay a non-refundable Laboratory Fee of $25.00 upon registration in term 1. All other diploma (other than MISM and NA) students are required to pay a non-refundable Laboratory fee of $5.00 at registration. Advanced Diploma students are required to pay a $250 laboratory fee per term.

The Marine Engineering Systems Design and Naval Architecture programs are computing intensive. Students will be provided with a state-of-the-art laptop computer starting in the second year of the program. This laptop will enable you to work on projects and to access the network (Internal or Internet) 24 hours per day/7 days per week for the duration of the program.

Participation in this arrangement is mandatory for all students enrolling in the Naval Architecture and Marine Engineering Systems Design Programs.

Students entering the second year of the Marine Institute technology diplomas in Naval Architecture and Marine Engineering Systems Design must pay a Laboratory Fee of $450.00 per term and $225.00 per session.

Student Union Fees:
A Student Council Fee of $30.00 (full time) or $15.00 (part time) per term is compulsory. A total Provincial and Federal Canadian Federation of Students (CFS) Fee of $8.86 per term compulsory. All fees are payable at registration.

Application Fee:
A fee of $50.00 must accompany each application for admission to all Diploma, Advanced Diploma, and Certificate programs from any and all Canadian students.

Applicants who have attended a post-secondary institution outside of Newfoundland or who have Non-Canadian status must include a fee of $100.00 for admission to all Diploma, Advanced Diploma, and Certificate programs.

Recreation Complex:
All students in Diploma, Vocational/Technical Certificate and Transport Canada Certificate programs have access to Memorial University’s Recreation Complex. The mandatory fee for this is $58.18 per term or $29.09 per session.

Confirmation Fee:
A non-refundable, nontransferrable fee of $150.00 is required from all applicants who are accepted or conditionally accepted for any program offered by the Marine Institute, except courses being
offered by our Offshore Safety and Survival Centre. This fee ensures that your place is reserved in the program and is applied towards your tuition.

In order for a student to be assigned their seat for OSSC courses, the student must pay the full amount of the course up front. If a student is 100% sponsored by either a company or a funding agency, they must provide written proof of their sponsorship and their seat will be held for a student who is not 100% sponsored, the student must pay any portion of the fees not funded prior to being assigned a seat in the training course.

With 7 days written notice (prior to the start day of the course in which the student is registered) the student is eligible for a refund of all fees paid, less the $150 confirmation fee. In absence of this notice, all fees are forfeited upon cancellation.

Health And Dental Insurance:
The cost of health/dental insurance for Canadian students is $150.48 per term and dependent coverage is available upon request at an additional cost per family of $150.48 per term. International students should contact the Office of Student Affairs and Services for health/dental insurance information.

Students enrolled in another health/dental plan may apply to be excluded from the Marine Institute Student Union (MISU) plan by opting out online at https://onlineservices.greenshield.ca/StudentOptOut/OptOutClosed.aspx?ctd=42833&edu=32028 and provide proof of existing coverage. Acceptable proof will include, but is not limited to, the name of the company providing coverage, policy number, and specific reference to coverage.

The opt out deadline for any given academic term is two weeks after the first day of lectures. Students who opt out of the health/ dental plan in the Fall semester will automatically be opted out for the remainder of the academic year unless notification is made to the MISU to opt in.

The opt out deadline for any given academic term is two weeks after the first day of lectures. Coverage under the MISU student health/dental plan is on the basis of academic year. Therefore, if any student chooses to opt out of the plan, they must do so at the beginning of each and every academic year.

If a student is on long term sea phase, they are automatically excluded from the Marine Institute Student Union (MISU) plan and their seat will be held. If a student is 100% sponsored by either a company or Marine Institute, they must opt out of both plans if they do not wish to have that coverage.

Methods of Payment:
The following options are available for payment of fees to the Marine Institute:
Cash/Debit Card - Must be paid in person at the Cashier’s Office. Do not mail cash.
Cheque - May be mailed or delivered in person to the Cashier’s Office.
Credit Card – Effective December 31, 2013 VISA will disallow any credit card processing company in Canada from charging a convenience fee on Visa transactions. Therefore, as of January 1, 2013 MasterCard will be the only credit card accepted to pay online student accounts. However, an agreement has been signed with Moneris Solutions whereby Moneris will provide the ability to pay for tuition fees online using your Master Card on Student Self Service. In exchange for this service, Moneris will charge students a convenience fee of 1.95%.
Telephone or Online Banking – Customers of the Royal Bank of Canada, The Bank of Montreal, The Bank of Nova Scotia and Canada Trust who have access to the banks’ telephone or online banking systems can pay their fees using this service up to the last day to add courses for each semester. Further information on the use of these banking systems can be obtained from your local branch.
Tuition Voucher - Students receiving a tuition voucher must present the voucher and pay the balance of any fees to the Cashier’s Office by the published deadlines to avoid being assessed a late payment fee.

Student Loans:
Students enrolling in courses of 12 weeks or more in length may be eligible for Canada Student Loans.

For student loan purposes, the allowance for books is approximately $500.00 per semester or $1000.00 per year. For applicants from provinces outside Newfoundland and Labrador please contact the Student or Financial Aid office for your province. For further information concerning loan programs for students from Newfoundland and Labrador contact the Student Aid Branch of the Department of Youth Services and Post-Secondary Education as follows:

Internet: http://www.gov.nl.ca/studentaid

(Online applications and information)
E-mail: studentaid@mail.gov.nl.ca

Telephone: (709) 729-5849 (client service during business hours) or (709) 729-4244 and 1-888-657-0800 for automated information service

Facsimile: (709) 729-2298
Office: Coughlan College on the St. John’s Campus of Memorial University - Monday to Friday 9:00 A.M. to 4:30 P.M. (4:00 p.m. during the summer)

Mail: Student Financial Services Division Department of Youth Services and Post-Secondary Education P.O. Box 8700 St. John’s, N.L. A1B 4J6

Students unable to meet fee obligations while awaiting a student loan must contact the Marine Institute’s Finance Office on or before the date that fees are due to arrange for a deferral of payment. Once loan documents are received at the Marine Institute, all fees owing will be signed out of the student loan account unless the student wishes to immediately pay by another method.

Student Residence:
Students attending the Institute may apply for accommodation to:

Manager of Accommodations
Housing, Food and Conference Services
309 Hatchet House
Memorial University of Newfoundland
St. John’s, NL A1B 3G7
phone: (709) 864 - 7590 or
E-mail: housing@mun.ca
Internet: http://www.mun.ca/hfcs/

All students are responsible for locating suitable accommodation for the duration of their studies.

Locker Fee:
Students wishing to obtain a locker will pay $20.00. Ten dollars will be refunded at the end of the year provided the lock is returned in proper working order.

Challenge Exam:
A fee equivalent to the cost of one course is payable by students applying to earn credit in a Marine Institute course by way of a challenge exam. Further information regarding challenge exams is provided in the section entitled Academic Regulations.

Late Registration Fee:
The Registrar schedules the registration period and deadline for each term. Students are advised of this information. Students who fail to register before the registration deadline date will be assessed a basic late registration fee of $20.00 as well as $10.00 per day per each day beyond the deadline.

Students unable to register on their scheduled registration date due to a pending outcome of a supplementary exam, re-read of an exam, or verification of admission from the Registrar’s Office will not be subject to a late registration penalty.

Supplementary Examination Fee:
A non-refundable supplementary examination fee of $50.00 is charged for each supplementary examination that a student writes. This fee must be submitted with the application to write supplementary examination(s).

Re-of Examination Fee:
A fee of $50.00 is charged for each examination re-read. It is refunded only if the mark is raised. This fee must be submitted with the registration for examination re-read(s).

Replacement of Certificate Fee:
A fee of $30 is charged for a certificate replacement.

Replacement of ID Card Fee:
A fee of $15.00 is charged for each replacement Student Identification Card.

Replacement of T2202a Fee:
An administration fee of $10.00 is charged for each replacement T2202A (Educational Deduction Form).

FEE PAYMENT AND REFUND POLICY

Payment Term:
All fees are due once a student registers regardless of the method of registration and must be paid by the fee deadline to avoid a late payment penalty.

The payment deadline for students in diploma programs is the first day of lectures in the term including work terms. The deadline for students in certificate or industry-response programs or courses is the date of registration.

Students who do not comply with the above may have their registration cancelled at the discretion of the Marine Institute.

Deferral of Fees:
Students who have been awarded a scholarship, bursary, Student Loan or other similar award, may be permitted to have their payment deferred until they are in receipt of the award or Student Loan. To request such a deferral, the student must submit an “Application for Payment Deferral” before the first day of lectures in the term. This form is available from the Finance Office.

Finance Charges:
Accounts outstanding on the last day of examinations in a semester/session will be charged interest at the prime interest rate plus two percent per annum. Such interest will apply effective the first day of lectures in that semester.

Late Payment Penalty:
Except as outlined in this policy, all overdue accounts will be subject to a late payment penalty. The late payment penalty is $15.00 per course up to a maximum of $60.00 per term or session.

Outstanding Fees:
Student accounts with outstanding balances for any reason will be ineligible to register for a subsequent semester until the outstanding balance has been paid in full by cash, certified cheque or money order.

Students with outstanding balances will not be awarded a diploma or certificate, and will not be issued an academic transcript of marks or letter of certification. A student with an outstanding balance at the conclusion of courses will not be eligible to receive any certificate. All fees must be paid in full by cash, certified cheque or money order.

Student accounts with outstanding balances will not be awarded a diploma or certificate, and will not be issued an academic transcript of marks or letter of certification. A student with an outstanding balance at the conclusion of courses will not be eligible to receive any certificate. All fees must be paid in full by cash, certified cheque or money order.
Returned Cheque Charge:
A $25.00 dishonored cheque charge will be made for each cheque tendered to the Marine Institute and not honored by the bank. A student with a dishonored cheque record must pay fees by cash, debit card, certified cheque, or money order.

STUDENT FEES REFUND POLICY:

TUITION

<table>
<thead>
<tr>
<th>Program</th>
<th>Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Semester Programs</td>
<td></td>
</tr>
<tr>
<td>in the first 11 days of class</td>
<td>100%</td>
</tr>
<tr>
<td>Day 12 to Day 16 of classes</td>
<td>50%</td>
</tr>
<tr>
<td>Day 17 to Day 21 of classes</td>
<td>25%</td>
</tr>
<tr>
<td>Day 22 and beyond</td>
<td>0%</td>
</tr>
<tr>
<td>Less than Full Semester Program</td>
<td>Refund</td>
</tr>
<tr>
<td>in the first 5 days of classes</td>
<td>100%</td>
</tr>
<tr>
<td>Day 6 to Day 8 of classes</td>
<td>50%</td>
</tr>
<tr>
<td>Day 9 to Day 11 of classes</td>
<td>25%</td>
</tr>
<tr>
<td>Day 12 and beyond</td>
<td>0%</td>
</tr>
</tbody>
</table>

Technical Sessions that are between 16 and 20 days Refund

<table>
<thead>
<tr>
<th>Session</th>
<th>Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the first 4 Days of classes</td>
<td>100%</td>
</tr>
<tr>
<td>Day 5 to Day 6 of classes</td>
<td>50%</td>
</tr>
<tr>
<td>Day 7 to Day 8 of classes</td>
<td>25%</td>
</tr>
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</table>

STUDENT UNION & ALL OTHER COMPULSORY FEES

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NOTE:
No refund for programs 3 weeks or less

The Marine Institute scholarship program is made up of internally and externally administered scholarships. There are normally two scholarship presentations in an academic year; one in November and the other in March. The application deadline dates for the current academic year appear in the list of important dates printed at the front of the calendar. Students must apply for scholarships each term. One application form covers all scholarships Marine Institute Committee on Scholarships. Students may be required to submit additional application forms to be considered for externally administered scholarships.

SCHOLARSHIP GUIDELINES:

These guidelines cover scholarships and awards administered by the Scholarship Committee of the Marine Institute Academic Council.

- An applicant must be a registered full-time student of the Institute for the current academic year and satisfy the general conditions outlined below. In addition, certain scholarships and awards have special requirements which must also be met.
- For the academic year under consideration, applicants normally shall have taken a course load equal to or greater than that prescribed for their program. Students who take more than the normal course load shall have their average based on the courses actually taken. In cases where students take a reduced load, a maximum of a one course reduction for the entire academic year is allowed.
- In any one academic year, a student normally shall be granted only one scholarship which is administered by the Marine Institute Scholarship Committee.
- There is no limit on the number of external scholarships which a student may hold. For the purpose of these regulations, an external scholarship shall be deemed to be a scholarship that is administered or approved by an external committee (e.g. Ocean Ranger, Atlantic Accord, Master Mariners, etc.)

A scholarship or award normally is given to the eligible student with the highest marks. In the event of a tie, the following shall apply:
- In the case where the students are taking an unequal number of courses, the student taking the larger number of courses shall be awarded the scholarship.
- In the case where the students are taking an equal number of courses, the unrounded course marks shall be used and the student with the higher average shall be awarded the scholarship.
- In the case where the unrounded averages are equal, every attempt will be made to award all students concerned with scholarships of equal value.
- Entrance scholarships shall be awarded on the basis of the high school marks used to determine entrance eligibility.
- First year students shall be awarded scholarships based on their performance in the first term.
- Second and third year students shall be awarded scholarships based on their performance in the preceding year.
- Students who have received a diploma of technology from the Institute and who are returning to receive another diploma of technology shall be eligible for scholarships provided that they returned to studies in the academic year immediately following the one in which they graduated. They shall be evaluated on the basis of their academic performance in the graduating year of their first diploma including any courses done as part of the new diploma.
- Advanced diploma students shall be evaluated on the basis of their performance in the first term of their program.
- Students entering the Bachelor of Maritime Studies and Bachelor of Technology programs shall be evaluated on the basis of their marks in the graduating year of their diploma program.
- Transport Canada students shall be awarded scholarships and awards based on the recommendation of their faculty.
- Certificate students in one year programs shall be evaluated on the basis of their performance in the first term.
- Students in program of less than one academic year in length shall not be eligible for scholarships unless a scholarship is identified for their specific program.
- Students must apply for scholarships, although the committee reserves the right to award scholarships to students who do not apply. Students who fail to apply may not claim any right of consideration by the Institute.
- Students shall be required to have a minimum average of 70% for the academic year under consideration.
- Students who write supplementary examinations in the year under consideration shall not be eligible for scholarships.
- Students must have passed all courses in the year under consideration.
- Where possible, marks will be correlated with scholarship value.
- Awards given for performance in a specific area are based upon the recommendation from the school. As such, the nominee need not meet the overall minimum overall average requirement for the course load requirement. The nominee must have been registered as a full-time student for the year under consideration.
- Pass/fail courses completed as requirements for external certification (e.g. MED, First Aid, Radio Operator) shall not be calculated in the course load provided they were done as blocks and not concurrent with other courses.
- Students in the diploma programs who are admitted to pre-BMS or pre-Btech may use courses from those programs to maintain the required course load for scholarships.
- Students who have been convicted of an offence under the academic misconduct code are not eligible for scholarships.

A number of the scholarships have additional specific requirements which must be met. The Scholarship Committee reserves the right to award scholarships to students who have not applied. However, students who do not apply may not claim any right of consideration by the Institute.

From time to time special scholarship programs are offered by outside agencies. Notice of these scholarships is posted on the Student Affairs notice board outside Room 3307. Usually more detailed information and application forms are available from the Student Affairs Office, Room W3013.
The Algoma Central Corporation Scholarship
One scholarship is awarded annually to a student beyond first year in both the Nautical Science and the Marine Engineering diploma of technology programs.

April Arnott Memorial Scholarship
This scholarship is established by the Human Resources Department at Memorial University. The scholarship will be valued at a portion of the interest on the endowment and will be awarded annually. To be eligible, candidates must be enrolled full-time in the third year of the Marine Environmental technology program. Candidates can be nominated by the students in the Marine Environmental Technology class, and nomination forms are available in the Student Affairs office at the Marine Institute. Final selection will be made by the Marine Institute Scholarship Committee with first preference given to candidates of any age who has demonstrated academic ability, high energy and compassion toward others.

The John N. Barrett Scholarship
This scholarship, the yearly interest from an endowment to be awarded to a deserving diploma student who plans to continue his/her studies at the Institute, was donated by Dr. C. R. Barrett in memory of his father.

The William Barter Memorial Bursary in Protecting Marine Environments
This bursary was established by a donation from Gloria Barter, daughter of William Barter. William Barter was born in 1907 and worked as a fisherman in Bay de Verde. He was a successful fisherman, committed community leader, and founding member and chairman of the Bay de Verde Co-operative. The co-op ran a general store and a cod liver factory, and supported local fishermen by providing loans which increased their autonomy and ability to negotiate the best price for their catch. William Barter was a member of the first town council from 1950-51 and was particularly interested in community affairs, politics and the sustainability of the fishery. He was a lifelong learner and an avid reader. He believed education provided the ability to choose your path and achieve your goals, no matter what your occupation. One bursary will be awarded annually to a student studying in the Marine Environmental Technology program. Preference will be given to a Canadian student who has completed the first year of the program. Preference will be given to a student with a particular interest in fisheries conservation. This bursary will be awarded in the winter/spring semester.

The Raymond Bartlett Memorial Scholarship
This scholarship, the interest from an endowment in memory of a former student, is presented in alternate years to a student in the third year of the Marine Environmental Technology program. The recipient will be a Nautical Science Student who has completed a work term with Atlantic Towing, but if that criteria cannot be met the scholarship will be awarded based on the above criteria, but extended to a student term location.

Atlantic Towing Scholarship
Atlantic Towing is part of the J.D. Irving Group of Companies with operations including servicing and development in the offshore industries off Newfoundland and the Maritime Provinces of Canada. The company has had a long-standing relationship with the Memorial University Fisheries and Marine Institute working as a key partner in work term placement and graduate employment of our seafaring students. The scholarship will be awarded two times per year, one scholarship in the fall and one in the Spring scholarship ceremony. The Fall scholarship recipient will be a Nautical Science Student who has completed their first year - students must meet the general scholarship eligibility criteria and must be a resident of New Brunswick, Nova Scotia, Prince Edward Island or Newfoundland and Labrador. Initial preference for both scholarships will be given to students who have completed a work term with Atlantic Towing, but if that criteria cannot be met the scholarship will be awarded based on the above criteria, but extended to a student term location.

Dr. C. R. Barrett Scholarship
This scholarship, the yearly interest from an endowment donated by Dr. C. R. Barrett on his retirement as President of the College of Fisheries, Navigation, Marine Engineering and Electronics, will be awarded to a deserving Diploma of Technology student.

The Canadian Federation of University Women St. John's Marine Institute Scholarship
The Canadian Federation of University Women (CFUW) is an organization committed to promoting equality for women and girls. CFUW-St. John’s provides annual funding for scholarships to women who are enrolled in full-time studies at the Fisheries and Marine Institute of Memorial University of Newfoundland. The criteria and value of these scholarships are determined on a year by year basis by the CFUW Scholarship Committee. The recipients must meet the minimum academic requirements for a scholarship as defined by the University.

The Canadian Institute of Marine Engineers (Newfoundland Branch) Award
This award is given on recommendation of the Executive Director to the student most outstanding in practical and theoretical work with an average of not less than 75% at the end of the first year of training in Marine Engineering or Marine Engineering Systems Design.

The Captain Lloyd Bugden Memorial Scholarship
This scholarship in memory of the late Captain Bugden is awarded to a student in either the second or third year of the Nautical Science diploma program.

CARIS Scholarship
CARIS software is widely used in the Ocean Mapping program at the Marine Institute campus. In an effort to further foster the positive relationship between CARIS and the Marine Institute CARIS has established this scholarship.

Centenary of Responsible Government Scholarships
These scholarships sponsored by the Government of Newfoundland and Labrador are awarded to the two students who obtain the highest marks in a three year technology program.

Daley Scholarship
This scholarship has been established with commitment from Andrew and Christine Daley. The Daley family has a long-standing relationship with the Marine Institute. A number of family members are alumni of the Institute and the family has been long-standing supporters of the provincial fishery. CARIS has provided opportunity for various training partnerships. Two scholarships will be awarded annually in the Fall scholarship ceremony. One will be awarded to a 3rd year Naval Architecture student and the other to a Nautical Science student.

Corey Eddy Memorial Scholarship
The Corey Eddy Memorial Scholarship is awarded to Corey Eddy, a graduate of MI’s Marine Engineering Systems Design program who passed away in the Cougar Flight 491 crash. Awards were established by family and friends through funds raised at the Corey Eddy Memorial Golf Tournament, Scholarship is awarded to a student beyond first year in the Marine Engineering Design program.

The Wayne Dalton Memorial Scholarship
This scholarship in memory of Wayne Dalton is awarded to a student pursuing the Marine Science or Marine Engineering Technology Program. Preference shall be given to a student from Baltimore High School.

Donald W. K. Dawe Memorial Scholarship
This scholarship comes from the yearly interest of a trust fund donated by the family, friends and associates of the late Donald W. K. Dawe, O.C., the first chairman of the Board of Governors of the College of Fisheries, Navigation, Marine Engineering and Electronics. It will be awarded annually to a deserving student who has successfully completed at least one year at the Institute. Preference may be given to a student from rural Newfoundland and Labrador.

Donald W. K. Dawe Scholarship
This scholarship is awarded to a student who plans to continue his/her studies at the Institute.

The Frank Doppinger Memorial Scholarship
This scholarship was established by the family of Frank Doppinger former Chairman of the Fishing Industry Advisory Board, as a memorial of his contributions to the Newfoundland Fishing Industry. It is awarded annually to a student in a fisheries-related program based on academic performance.

Randy Emberley Memorial Scholarship
Randy Emberley Memorial Scholarship, donated by his fiancee Jeanie Sutton, is given in memory of Randy Emberley, a former graduate of the Marine Institute who died tragically. This scholarship valued at $200 is awarded annually to a student in Nautical Science, who is a native of Newfoundland.

The Captain Bill Ennis Memorial Scholarship
This scholarship in memory of Captain William (Bill) Ennis, a Marine Institute faculty member and prominent Newfoundland fishing captain, is given to a student in the Bachelor of Maritime Studies program who has completed the Nautical Science diploma program at the Marine Institute.

ESRI Canada GIS Scholarship
The ESRI Canada GIS Scholarship is a national scholarship given by ESRI Canada recognizing MI for a strong, multidisciplinary approach to coastal and shelf systems (GIS) in MI’s new Joint Diploma/Degree in Ocean Mapping.

Charles Evans Memorial Scholarship
This scholarship, the yearly interest from an endowment by the family of Charles Evans, a former student of the Marine Institute, is awarded to a student in Nautical Science, upon the recommendations of the Head of the School of Maritime Studies.

The Melvin Freid Marine Safety Award
Donated by Alpha Beta Sigma Phi in remembrance of Mel Freid who lost his life in the Ocean Ranger disaster. This award

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is presented annually to a student who shows initiative and enterprise in the field of marine safety or to assist in a research project in marine safety.

Friends of India Association Scholarship
Awarded annually to the student with the highest average in the third year of the University of Newfoundland. The scholarship shall be awarded annually to a student who has demonstrated outstanding leadership throughout the course of his/her Marine Institute program, through academic work, professional work placements, and community involvement. The recipient must meet the minimum academic requirements for a scholarship as outlined by Memorial University of Newfoundland. This award will be granted by the Fisheries and Marine Institute Scholarship Committee, upon recommendation of a sub-committee of the Scholarship Committee and faculty recommendation. Applicants must complete the Fry Family Foundation Student Leadership Awards at the Fisheries and Marine Institute Application.

The Neil Gall Memorial Leadership Scholarship in Ocean Technology
Neil Gall was a natural relationship builder with a thriving career in ocean related research, development and policy. He was Executive Director of the national research network, MEOPAR (Marine Environmental Observation Prediction and Response Network). He had also been Executive Director of "Briges", an ocean technology marketing initiative at the Marine Institute. Earlier, as Manager of Ocean Technology Partnerships he played a key role in the development of the Government of Newfoundland and Labrador’s ocean technology development strategy, “Oceans of Opportunity.” Neil Gall was a charismatic man with a sharp mind, a quick wit, and a warm heart that he shared with his loving family and extended circle of colleagues and friends. This memorial scholarship was established from a collective gift from his family, friends, colleagues and employers. Valued at a portion of the income on the endowment, the scholarship will be given annually to a full-time student with scholarship standing graduating at the end of a four year program at the School of Ocean Technology at the Marine Institute. In awarding this scholarship preference will be given to candidates who have demonstrated outstanding leadership throughout the course of his/her Marine Institute program, through academic work, professional work placements (if applicable), and community involvement. The recipient must meet the minimum academic requirements for a scholarship as outlined by Memorial University of Newfoundland. This award will be granted by the Fisheries and Marine Institute Scholarship Committee, upon recommendation of a sub-committee of the Scholarship Committee and faculty recommendation. Applicants must complete the Fry Family Foundation Student Leadership Awards at the Fisheries and Marine Institute Application.

The Vice-President’s Fry Family Foundation Excellence in Leadership Award
This leadership award is established by the Fry Family Foundation, an organization that contributes significantly to student scholarships and awards throughout Newfoundland and Labrador. The foundation is dedicated to building stronger communities and developing future talent for Newfoundland and Labrador. The Fry Family Foundation Leadership Awards at the Fisheries and Marine Institute were established by the Fry Family Foundation Scholarship Committee and faculty recommendation. Applicants must meet the minimum academic requirements for a scholarship as outlined by Memorial University of Newfoundland. This award will be granted by the Fisheries and Marine Institute Scholarship Committee, upon recommendation of a sub-committee of the Scholarship Committee and faculty recommendation. Applicants must complete the Fry Family Foundation Student Leadership Awards at the Fisheries and Marine Institute Application.

The Harbour Grace Shrimp Company Women in Nautical Science Scholarship
This scholarship was established by the Harbour Grace Shrimp Company Limited. Two scholarships will be awarded to female students enrolled fulltime and beyond first year in the Nautical Science Program at the Marine Institute, one awarded in the Fall semester and one in the Winter semester. Priority will be given to a student who is enrolled full-time. The recipient must have either graduated from a high school in rural Newfoundland and Labrador or contributed to rural marine communities through her field of studies.

The Harvey Head Memorial Scholarship
This scholarship is presented to a full-time student entering the Bachelor of Technology program.

Sidney Hann Memorial Scholarship
In memory of Sidney Hann a Marine Institute graduate and pioneer of the provincial and national fishery industry. The Sidney Hann Memorial Scholarship will be given annually to a full-time Newfoundland student enrolled in a program within the School of Fisheries at the Marine Institute.

L.C. Halfyard Scholarship
The L.C. Halfyard Scholarship was established by Dr. Laura C. Halfyard, a Marine Institute faculty member and alumna, who wishes to encourage young women in their chosen career options. The L.C. Halfyard Scholarship will be given annually to a full-time student who is enrolled in an academic program and demonstrates a high level of academic ability and dedication to healthy living. The bursary is in honour of Rosalind C. Halfyard, a Marine Institute graduate who committed to healthy living for over 25 years via her position at the Marine Institute and her involvement in activities across Newfoundland and Labrador.

The Harvey Head Memorial Scholarship
This scholarship is presented to a full-time student entering the Bachelor of Technology program who has graduated from the Electronics and Engineering program at either the Marine Institute, Capo College, or College of the North Atlantic and who has maintained a minimum of 70% average throughout the diploma program.

The Hebron Diversity Award
This award was created from a generous contribution from the Hebron Project. The Hebron Project co-venturers are ExxonMobil Canada Properties (operator), Chevron Canada, Suncor Energy, Statoil Canada and Nalcor Energy. Awards will be available to full-time and part-time students, enrolled at any campus of Memorial University of Newfoundland, who have aboriginal status, a disability, or who represent a visible minority. Students with a disability should provide supporting documentation (from a medical doctor, psychologist, audiologist, rehabilitation counselor, or other professional whom the student wishes to recognize). To be considered for this scholarship, students must demonstrate a high level of academic ability, and dedication to healthy living. The scholarship is awarded annually to a student who demonstrates a high level of academic ability, dedication to healthy living and who wishes to encourage young women in their chosen career option.
or part-time studies at any Campus of Memorial University of Newfoundland who are entering or pursuing a post-secondary program of studies. In selecting candidates, preference will be given to students who are entering second or third year study, such as but not limited to the Marine Advanced Technology Centre for Fisheries Ecosystems Research.

Marine Atlantic Scholarship
A total of four scholarships shall be awarded each year. Two shall be given to students in either second or third year of Nautical Science program and two shall be given to students in either second or third year of the Marine Engineering program. Recipients shall be residents of either Nova Scotia or Newfoundland and Labrador.

Marine Institute Bronze Medals
Marine Institute Bronze Medals, presented at Graduation, are awarded to students with the highest standing in the final year of their programs.

Marine Institute Scholarship
This scholarship may be awarded to students in any program eligible for scholarships.

Marine Institute Science Fair Scholarships
The Marine Institute sponsors up to eight entrance scholarships to the Marine Institute. Up to two recipients may be selected from the Grade XI and XII entries in the senior division of each of the four Newfoundland regional science fairs. Recipients must enroll in the Marine Institute in the next academic year following graduation from high school in order to claim the award. Preference will be given to students who are entering the first year of a Marine Institute program.

Marine Institute Student Union Scholarships
The Marine Institute Student Union has established four scholarships which are awarded to students with demonstrated financial need and involvement in student affairs.

Marine Institute Sustainable Aquaculture Scholarship
This scholarship is awarded to a student in the Advanced Diploma in Sustainable Aquaculture program and is based on academic performance.

Memorial University Entrance Scholarships
These scholarships are awarded to students entering the technology program based on high school academic performance.

Middle Cove Memorial Scholarship
This scholarship, established from the interest of an endowment by members of the Canadian Coast Guard in the Newfoundland and Maritime Regions in memory of very few colleagues who lost their lives in the line of duty, is awarded annually to a second or third year student in Maritime Studies.

EXXON/Mobil Oil Canada Scholarship
This scholarship is awarded annually to a student with high academic performance.

Captain Wilfred B. Morgan Memorial Scholarship
Donated by his wife and children as a memorial to Captain Wilfred B. Morgan, who served as a Master with C.N.R. and was a Master of the Institute's M.V. Beinir, this scholarship is awarded annually to a Nautical Science student entering second year. Preference shall be given to a student from the Labrador coast.

Ocean Choice International Scholarships (Entrance Scholarships)
These scholarships are awarded annually to students entering the Marine Institute.

Ocean Ranger Scholarships and Bursaries
To commemorate the tragic loss of the 54 crew members of the Ocean Ranger on Feb. 15, 1982, a scholarship and bursary program has been established by the Ocean Ranger Disaster Fund. These awards, valued at $500.00 per year, are presented to students who are entering or pursuing a post-secondary program of studies. In selecting candidates, preference will be given to students who are descendants of crew members, and/or widows of those who lost their lives. In the absence of eligible candidates from this group, the scholarships and bursaries may be awarded to other students at the discretion of the Ocean Ranger Scholarship Committee.

Oceanex Scholarship
Oceanex is a company with vision to become one of the most successful transportation companies in Eastern Canada. The company has had a long-standing relationship with the Marine Institute and Memorial University, working as a key partner in work term placement and graduate employment of seafaring students, and this scholarship reflects the desire to continue to foster this positive relationship. The scholarship will be awarded in both the Fall and Spring scholarship ceremonies. The fall scholarship recipients will be Nautical Science and Marine Engineering students beyond first year; for the Spring scholarship, preference is for a Marine Engineering student who has completed their second sea phase in the fall semester. Students must meet the general scholarship eligibility criteria and have a superior work term evaluation. Initial preference for the scholarship will be given to students who have completed a work term with Oceanex, with secondary preference given to a high-achieving student in Nautical Science or Marine Engineering. The scholarship will be awarded by the Marine Institute Scholarship Committee.

The Oil and Gas Week Scholarship
This scholarship was established by the Oil and Gas Week Steering Committee in support of students in petroleum related programs. In order to be eligible for the scholarship will be awarded to a student beyond their first year of study, with preference given to students who graduated from a high school in Newfoundland and Labrador outside of the metropolitan St. John’s area. To be eligible, the student must be enrolled in a program in Nautical Science, Marine Engineering, Marine Engineering Systems Design or Naval Architecture.

Pikalujak Fisheries Scholarship
Pikalujak Fisheries Limited is the owner of a Northern Shrimp Fishing License. The link between Pikalujak Fisheries Limited and the Marine Institute has developed over the course of the Marine Institute’s history. The Scholarship is awarded to foster the positive relationship between Pikalujak Fisheries Limited, Government of Nunatsiavut and the Marine Institute. It has established a scholarship in the Marine Institute's Student Awards program.

Public Service Credit Union Award for Leadership
This award was established by a generous donation from the Public Service Credit Union. Public Service Credit Union has been committed to charitable organizations and scholarships since 2012, and is proud to be a supporter of the Marine Institute of Memorial University of Newfoundland. Valued at $500, an award will be given annually to a student in the Fisheries and Marine Institute who has been accepted to participate in a Marine Institute team related to a marine field of study, such as but not limited to the Marine Advanced Technology Education (MATE) Competition Team. The award will be granted based on academic merit to a student who has displayed leadership and dedication to marine studies. The scholarship will be given to a student within the School of Ocean Technology. Recipients must meet the minimum academic requirements for an award as determined by the Marine Institute, Faculty of Engineering and Applied Science, Memorial University of Newfoundland. This award will be granted by the Fisheries and Marine Institute Scholarship Committee upon Marine Institute Faculty nomination.
Captain Peter & Mrs. Olive Parsons Memorial Scholarship
The Captain Peter and Mrs. Olive Parsons Memorial Scholarship commemorates a Newfoundland master mariner who knew the power of the sea and his wife who recognized the value of education. The interest from the endowment is awarded annually to a student in either the second or third year of the Nautical Science Diploma of Technology Program who is a native Newfoundlander or Labradorian, or whose parents are natives of the province.

St. John's Port Corporation Scholarships
These scholarships were established by the St. John's Port Corporation to recognize the academic achievements of students studying in the marine fields. Preference shall be given to students in second and third year Nautical Science.

Canadian Association of Prawn Producers Scholarship
This Scholarship is to be awarded to a maximum of 3 students who are entering the Marine Engineering Diploma of technology program who are Canadian citizens. This scholarship is renewable for up to 3 years at a value of $5000 per year. Students seeking renewal of the scholarship must remain in scholarship standing at the Institute.

The Professional Fish Harvesters Certification Board Scholarship
The scholarship is awarded to a certified fish harvester or a dependent who is entering the second year of a three-year diploma program of technology.

Gerald F. Pye Memorial Scholarship
This scholarship in memory of Gerald F. Pye, a former student, was established by his wife Cindy Power. It is awarded to a student in the third year of the Ocean Technology program based on academic performance and demonstrated strong work ethic.

Vincent and Violet Raymond Scholarship
This scholarship is awarded annually to a second or third year Naval Architecture or Marine Engineering $1000 scholarship student who has been recommended by his or her instructors as having demonstrated dedication and effort in his or her studies. The intent of this scholarship is to encourage good students though they may not be the top students in the class.

Ian J. Reid Award
This award has been developed in memory of Mr. Ian J. Reid, an individual who contributed greatly to his community. He was a veteran of World War 2 and maintained an active naval connection, and also served his community in a volunteer capacity within numerous organizations. He was a smart business leader and was delighted to be the first chair of the Canadian Centre for Fisheries Innovation. This award will be granted by the Fisheries and Marine Institute Scholarships Committee. Preference may be given to financial need.

The Roy Russell Memorial Bursary
This bursary was established by the family of the late Roy A. Russell in recognition of the interest Mr. Russell had in providing employees with an opportunity to excel in their chosen activity and to achieve new goals.

St. John's Rotary Scholarships
Two scholarships shall be awarded to students entering their final year of studies. In selecting candidates for the scholarships, the Scholarship Committee will consider academic achievement, participation in Institute activities, and the personal attributes and personal qualities appropriate to the student’s chosen field of endeavour.

W. Gary Rowe, QC Scholarships at the Fisheries and Marine Institute
These endowed undergraduate scholarships were established through a generous gift from the estate of the late W. Gary Rowe (1944-2010), lawyer, art collector and philanthropist. Mr. Rowe had graduated from Memorial University with a Bachelor of Commerce degree and Dalhousie University with a Bachelor of Laws degree before being called to the Bar in Newfoundland in 1970. In 1972 he was a founding partner of the firm Snider Green and Rowe, which grew to become one of the largest in St. John’s with more than 20 lawyers at the time of its merger with the regional firm Miconos Coop in 2000. Mr. Rowe was appointed Queen’s Counsel in 1988. Valued at a portion of the income on the endowment, one or more scholarships will be awarded annually to students attending the Fisheries and Marine Institute of Memorial University of Newfoundland. Preference will be given to those with demonstrated financial need. The recipients must have graduated from a high school in Newfoundland and Labrador and meet the academic requirements for a scholarship as defined by the University.

Hazen A. Russell Scholarship in Fisheries
Two scholarships, the annual interest from a $25,000 trust fund, will be awarded to qualified second and third year students in fisheries and related marine technology. The trust fund is a donation by the family of the late Hazen A. Russell, who made a major contribution to the development of the Newfoundland fishing industry. These scholarships honour the memory of an outstanding businessman whose success was due in no small measure to his commitment to quality control and technical innovation.

Secunda Canada Scholarships
Secunda manages a harvester-drift net of offshore support vessels servicing major oil and gas companies in Atlantic Canada. Secunda, founded in Nova Scotia, has a fleet of six vessels utilizing high-grade marine equipment, a maritime work ethic, and a philosophy of providing a superior service to its customers. Today, the company has developed a relationship with the Marine Institute working as a partner in work term placement and graduate employment of seafaring students. In an effort to foster the positive relationship between Secunda Canada and the Marine Institute and to expand on its tradition of investing in diverse set of young people entering the marine industry, the company has established this scholarship. The scholarship recipients will be a first year marine engineering or nautical science students who meet the general scholarship eligibility criteria with preference to given to female, aboriginal and visible minority students.

The Captain Michael J. Simmons and Arthur Simmons Memorial Scholarship
This scholarship in memory of two gentlemen who had a long association in the shipbuilding and fishing industries is awarded to a student in the Coastal Zone Management program.

The Jane Simos-Re Memorial Scholarship
This endowed memorial scholarship was established from a gift from Captain Jos M. Simos-Re, husband to Jane Simos-Re. Originally from Portugal, Captain José M. Simos-Re has had a long standing relationship with the Marine Institute as an instructor in the School of Maritime Studies, teaching various levels of students enrolled in both traditional and online programs. Earlier, he studied at the College of Fisheries (a predecessor of the Marine Institute). Originally from Newfoundland, Jane Simos-Re (née Kennedy) was a grade school teacher. This scholarship is established as a testament to Jane’s passion for education and for her support of her husband’s teaching career at the Marine Institute. Valued at a portion of the income on the endowment, the scholarship will be awarded annually to a student enrolled in their final year of a Nautical Science program at the Marine Institute based on academic performance in the program’s second year of study.

The Skinner Memorial Scholarship at the Fisheries and Marine Institute
This term scholarship was established by a generous donation from the Estate of Edith and Robert Skinner. Robert Skinner (1920-2008) and Edith Skinner (1922-2010) spent most of their married years living in Pasadena, NL, where they operated a motel as well as two hunting and fishing lodges in Labrador. The Skinners believed strongly in the importance of fisheries and wildlife management and conservation. One or more scholarships will be awarded annually to an undergraduate student(s) entering full-time studies at the Fisheries and Marine Institute who have graduated from a High School in Western Newfoundland and Labrador (that is west of Grand Falls but including Labrador). The recipient must meet the minimum academic requirements for a scholarship as outlined by Memorial University of Newfoundland, with a preference for students with demonstrated financial need.

The Telegraphist Gordon W. Noseworthy, RN Memorial Scholarship
This scholarship in memory of Telegraphist Gordon W. Noseworthy, Royal Navy, who died in action during the Battle of the Atlantic (1939-1945) while serving in HMS Stanley, is awarded to a third year Nautical Science student who has successfully completed the required radio communications courses.

J. J. Ugland Memorial Scholarships
Valued equally at a portion of the income on the endowment, The J. J. Ugland Memorial Scholarships will be awarded to one marine engineering student and one nautical science student. The J. J. Ugland Memorial Scholarship is for first-year MI students and is renewable for one year if scholarship standing is maintained.

Moving Forward Together Campaign Award
This Award was established by two generous donations as a part of the Moving Forward Together Campaign by the Sisters of Mercy of Newfoundland and the Presentation Sister of Newfoundland and Labrador. Moving Forward Together is a Canada-wide campaign to bring fundamental and lasting change to Aboriginal communities in Canada by supporting healing and educational programs. Values at $1800.00, it will be awarded to an undergraduate Aboriginal student beyond their first year of studies at Memorial University of Newfoundland. There will be one Award annually at each of the St. John’s and Gander campuses. The Award is renewable for an additional two years. The student must meet the minimum academic requirements for an award as defined by Memorial University. This award will be granted by the Senate Committee on Undergraduate Scholarships, Bursaries and Awards.

MARINE INSTITUTE ENTRANCE SCHOLARSHIPS

SCHOLARSHIP OVERVIEW:

Eligibility Criteria
To be eligible for any Marine Institute Entrance Scholarship students must first meet all Marine Institute entrance requirements as outlined in the Marine Institute Calendar.

MI Entrance Scholarship Average will be compiled from the grades received in the following courses:

• 2 English credits, 3rd Level English (3201)
• 4 Math credits, 2 from 3rd Level Math (Academic or Advanced) and 2 from 2nd Level Math (Academic or Advanced)
• 4 credits in Laboratory Science (2 credits must be a 3000 level course)
• 2 credits in a social science or classical language (must be a 3000 level course)
• 2 credits at the 3000 level in an elective course (maybe from the courses listed above or additional courses approved by the Dean of Studies)

Scholarship Allocation
Students obtaining an average of:
• Between 80 and 84.9% - will receive a Marine Institute Entrance Scholarship valued at $1000
• Students will also be assessed in accordance with Memorial University’s entrance scholarship program to determine that they are awarded a scholarship if eligible.

Regulations
• Entrance scholarships are to be awarded in the Fall Semester.
• The MI entrance scholarships are open to Canadian citizens and permanent residents graduating from secondary school, who are admitted to the Marine Institute on the basis of high school grades and current entrance standards, and who must meet the above outlined entrance requirements. They are also open to students in the above category who may not be coming directly from high school. This is limited to those who have previously graduated from high school, are admitted to the Marine Institute on the basis of high school grades and current entrance standards, and who meet the above outlined entrance requirements.
SCHOLARSHIPS, BURSARIES AND AWARDS

- Students may receive only one internal entrance scholarship.
- Any student in receipt of an externally funded entrance scholarship is still eligible to receive a MUN or MI entrance scholarship.
- Students who have previously attended other post-secondary institutions public or private, transfer students or mature students are not eligible for MI entrance scholarships.
- A student who is awarded an MI entrance scholarship as a new matriculant does have the option to apply to defer the scholarship offer for one year. To defer a scholarship, the student must provide written documentation in the form of a letter to the scholarship administrator. The letter must detail the reasons for deferring the scholarship. All applications are reviewed by the scholarship committee.

Awarding of Scholarship
- Scholarship payment will only be made after the last date to drop and add courses for that specific academic term as reflected in the proper academic diary.
- If a student drops below a full time course load in their first term of study, the scholarship offer will be revoked and no payment will be issued.
- Marine Institute Entrance Scholarships are a one-time non-renewable award

MARINE INSTITUTE ADVANCED DIPLOMA ENTRANCE SCHOLARSHIPS

SCHOLARSHIP OVERVIEW:

Eligibility Criteria
To be eligible for the Marine Institute Advanced Diploma Entrance Scholarship students must first meet all Marine Institute entrance requirements as outlined in the Marine Institute Calendar.

MI Entrance Scholarship Average for the Advanced Diploma level will be based on the overall average in all courses attempted (excluding those in first year of an undergraduate program but including post baccalaureate courses).

Scholarship Allocation
Students obtaining an average of:
- Over 75% will receive a Marine Institute Entrance Scholarship valued at $1000

Regulations
- Entrance scholarships are to be awarded in the Fall Semester.
- The MI entrance scholarships are open to Canadian citizens and permanent residents graduating from North American post-secondary institutions, who are admitted to the Marine Institute on the basis of current entrance standards, and who meet the above outlined scholarship average. They are also open to students in the above category that may not be coming directly from post-secondary study. This is limited to those who have previously graduated from post-secondary, are admitted to the Marine Institute on the basis of entrance standards, and who meet the above outlined scholarship average.
- Students may receive only one internal entrance scholarship.
65 Undergraduate Degrees
70 Master’s Degrees
81 Joint Diploma of Technology/
  Bachelor of Technology
91 Post Graduate Certificate
95 Advanced Diplomas
99 Technology Diplomas
114 Technician Diplomas
119 Technical Certificates
130 Transport Canada Programs
GENERAL DEGREES
The Marine Institute offers two undergraduate degrees. For specific details on each degree refer to the appropriate Degree Program Regulations. The courses in the programs are available fully by distance and select courses are available on campus.

BACHELOR OF MARITIME STUDIES
The Bachelor of Maritime Studies program prepares graduates for career advancement in the maritime and related industries. It is designed for students who have graduated from accredited, or Transport Canada approved, diploma of technology programs in the marine fields. The program is also available to professional mariners, professional fish harvesters and certain Canadian Forces (Naval Operations) personnel. Courses in the program provide the student with an introduction to human resource and business management concepts, and the social contexts in which their careers will be based. The program consists of 39 credit hours in addition to work completed in a diploma program and can be taken on a full-time or part-time basis.

BACHELOR OF TECHNOLOGY
The Bachelor of Technology program prepares graduates for career advancement in health science technology or engineering/ applied science technology industries. It is designed for students who have graduated from an accredited diploma of technology program that is applicable to one of the two optional areas. Courses in the program provide the student with an introduction to human resource and business management concepts, and the social contexts in which their careers will be based. The program consists of 39 credit hours in addition to work completed in a diploma program and can be taken on a full-time or part-time basis.

The optional areas are:
• Engineering and Applied Science Technology Option, which is normally chosen by students who have an engineering/applied science technology diploma.
• Health Sciences Technology Option, which is normally chosen by students who have a health sciences technology diploma.

Admission/Readmission Regulations for Degree Programs
In addition to meeting the admission/readmission requirements for the University students must also meet the admission/ readmission requirements for the Marine Institute.

See UNIVERSITY REGULATIONS - Admissions/Readmission to the University (Undergraduate) (http://www.mun.ca/regoff/calendar/sectionNo=REGS-0268).
as a second degree, must complete a minimum of an additional 9 credit hours beyond a first degree and the work completed as required for admission to this degree.

Admission Requirements for Applicants to the Bachelor of Technology Program

1. An applicant must submit a form for admission/readmission to the University. This application must include all required documentation including proof of the diploma or certificate required for admission in a specific category.
2. Categories for admission to the Bachelor of Technology Program

Applicants must meet the regular admission requirements of the University and be eligible for admission in one of the following categories:

- Category A: applicants holding a diploma from the Marine Institute in marine engineering technology, naval architecture technology or marine engineering systems design technology, marine environmental technology.
- Category B: applicants holding a diploma of technology accredited by the Canadian Medical Association (CMA).
- Category C: applicants holding a diploma of technology in engineering/applied science technology accredited by the Canadian Technology Accreditation Board (CTAB).
- Category D: applicants holding a diploma of technology comparable to a Marine Institute or College of the North Atlantic three-year CTAB accredited diploma in engineering/applied science technology.
- Category E: applicants holding a diploma of technology comparable to a College of the North Atlantic three-year CMA accredited diploma.
- Category F: applicants holding a Certified Engineering Technologist (CET) designation or a Professional Technologist (P'Tech) designation along with a diploma of technology acceptable to the Admissions Committee.
- Category G: applicants who have Canadian Forces training acceptable to the Admissions Committee (For more information please contact cap@mi.mun.ca).

3. Upon acceptance into the program, students will be required to complete a minimum of 66 credit hours beyond a first degree and the work completed as required for admission to this degree.
4. The required and elective courses are listed in Table 2 Bachelor of Maritime Studies - Course Requirements for all Students. These courses may have prerequisites which have to be met.
5. When transfer credit has been granted for a course(s) taken to satisfy the requirements for admission, students may take an additional elective university course(s).
6. To meet the academic requirements for a Bachelor of Maritimes Studies a candidate shall successfully complete the program with a minimum overall average of 60% and a minimum of 50% in each course required for the degree unless stated otherwise within the course description.

Bachelor of Technology - Engineering and Applied Science Technology Options

Table 2 Bachelor of Maritime Studies - Course Requirements for all Students

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Group A Electives</th>
<th>Group B Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 3 credit hours in English at the 1000 level</td>
<td>• Business 1101 or 2102</td>
<td>• Economics 2010</td>
</tr>
<tr>
<td>• MSTM 4001</td>
<td>• Business 4000</td>
<td>• Economics 2020</td>
</tr>
<tr>
<td>• MSTM 4002</td>
<td>• MSTM 4005</td>
<td>• Economics 3030</td>
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<tr>
<td>• MSTM 4004</td>
<td>• MSTM 4008</td>
<td>• Economics 3360</td>
</tr>
<tr>
<td>• MSTM 4040</td>
<td>• MSTM 4011</td>
<td>• Geography 3510</td>
</tr>
<tr>
<td>• MSTM 4040</td>
<td>• MSTM 4012</td>
<td>• Geography 4410</td>
</tr>
<tr>
<td>• MSTM 410B</td>
<td>• MSTM 4013</td>
<td>• MSTM 4014</td>
</tr>
<tr>
<td>• MSTM 410B</td>
<td>• MSTM 4020</td>
<td>• MSTM 4030</td>
</tr>
<tr>
<td>• Statistics 1510 or 2500 or equivalent</td>
<td>• MSTM 4050</td>
<td>• Philosophy 2571</td>
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<tr>
<td></td>
<td>• MSTM 4090</td>
<td>• Political Science 3210</td>
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<td></td>
<td></td>
<td>• Political Science 4200</td>
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<td></td>
<td></td>
<td>• Sociology 2120</td>
</tr>
</tbody>
</table>

Bachelor of Technology - Health Science Technology Option

Table 3 Bachelor of Technology - Engineering and Applied Science Technology Options

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Group A Electives</th>
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<tr>
<td>• MSTM 4020</td>
<td>• Economics 3080</td>
<td>• Economics 3080</td>
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<tr>
<td>• MSTM 4040</td>
<td>• MSTM 4011</td>
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<td>• MSTM 4050</td>
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<td>• Statistics 1510 or 2500 or equivalent</td>
<td>• MSTM 4070</td>
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Bachelor of Technology - Health Science Technology Option

Table 4 Bachelor of Technology - Health Science Technology Option

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<thead>
<tr>
<th>Required Courses</th>
<th>Group A Electives</th>
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<th>Group C Electives</th>
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<tr>
<td>• 3 credit hours in English at the 1000 level</td>
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<td>• Economics 2010</td>
<td>• Biology 2040 or 2041</td>
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<td>• MSTM 4040</td>
<td>• Business 4000</td>
<td>• Economics 2020</td>
<td>• the former Nursing 3023</td>
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<td>• MSTM 4060</td>
<td>• Economics 3360</td>
<td>• Economics 3080</td>
<td>• the former Nursing 4701</td>
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<td>• MSTM 4090</td>
<td>• MSTM 4011</td>
<td>• Geography 4410</td>
<td>• Psychology 2010</td>
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<td>• MSTM 410B</td>
<td>• MSTM 4012</td>
<td>• MSTM 4014</td>
<td>• Psychology 2011</td>
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<tr>
<td>• Statistics 1510 or 2500 or equivalent</td>
<td>• MSTM 4013</td>
<td>• MSTM 4015</td>
<td>• Psychology 2012</td>
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<td>• MSTM 4017</td>
<td>• MSTM 4016</td>
<td>• Psychology 2800</td>
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Bachelor of Technology - Health Science Technology Option

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UNDERGRADUATE DEGREES PROGRAMS

WAIVER OF DEGREE PROGRAM REGULATIONS

Students requesting waiver of University academic regulations should refer to University Regulations (Undergraduate) - Waiver of Regulations (http://www.mun.ca/regoff/calendar/sectionNo=REGS-0859).

GENERAL INFORMATION

- The Marine Institute reserves the right in special circumstances to modify, alter, or waive any Marine Institute regulation in its application to individual students where merit and equity so warrant, in the judgement of the Committee on Undergraduate Studies of the Marine Institute.
- Students requesting a waiver of a Marine Institute regulation must submit their request in writing to the head of the program who will forward a recommendation to the Chair of the Committee on Undergraduate Studies of the Marine Institute. Medical and/or other documentation to substantiate the request must be provided.
- Any waiver granted does not reduce the total number of credit hours required for the degree.

GRADUATION

Upon meeting the qualifications for any of the degree programs of the Fisheries and Marine Institute a student must apply to graduate by the appropriate deadline date on the prescribed "Application for Graduation" form. This form may be obtained on line at the Memorial Self Service at www.mun.ca/regoff/stuweb.htm. Additional information is available from the Office of the Registrar at www.mun.ca/regoff/graduation/apply_grad.php.

APPEAL OF DECISION

Any student whose request for waiver of Marine Institute regulations has been denied has the right to appeal. For further information refer to UNIVERSITY REGULATIONS - General Academic Regulations (Undergraduate) - Appeal Regulations (http://www.mun.ca/regoff/calendar/sectionNo=REGS-0859).

COURSE DESCRIPTIONS

4004 Marine Environmental Management will introduce students to the requirements for the safe management of the marine environment. The course will introduce major environmental problems and identify the major threats to the marine environment. It will provide a working knowledge of these threats and consider the possible counter measures that may be employed by employees in the marine industry.

4005 Trends and Issues in International Shipping will provide students with an understanding of how regulatory bodies and their legislation have evolved to affect the modern seafarers trading internationally. The course will develop an understanding of the various rules and regulations dealing with Classification, ISM, MARPOL, SOLAS, and SIRe inspections which have to be dealt with on a daily basis at sea.

4006 Introduction to Offshore Oil and Gas provides students with an understanding of the basic concepts of the oil and gas industry from a marine perspective. This course will cover the entire supply chain and industry structure from upstream to downstream.

4010 Assessment and Implementation Technology (formerly Technology 4010) examines the effects of technology on the physical, socio-economic, historic, cultural and aesthetic environments. The course also addresses relevant legislation, the generation and evaluation of project/product alternatives, and the predication, verification and mitigation of technological effects.

4011 Introduction to Intellectual Property and its Management is an introductory course to the management of Intellectual Property Rights (IPRs). This course will cover the philosophical rationale for intellectual property rights, its technical and legal considerations, its implications to the development of science and technology, and its social and economic impacts. The course also focuses on the application of IPRs in the oil and gas industry.

4012 Occupational Health and Safety Legislation and Management is an introduction to occupational health and safety issues in a technical/industrial context. Students will gain a knowledge and understanding of the legislative framework surrounding occupational health and safety, the assignment of responsibilities in the workplace, the management of occupational health and safety in the workplace and the importance of establishing a positive safety culture.

4013 Structure and Functions of Technology-based Organizations focuses on the emergence of technology-based companies and how to implement management practices that enhance organizational effectiveness. This course will concentrate on the integration of three basic frameworks which include the study of technological economics and organizational progression, structural configurations and operations, and universal and contemporary approaches to organizational design. In addition it will examine the challenges facing the new face of dynamic industries: individual and organizational change, technological change, and national and global change.

4014 Technology and the Environment will help students critically examine technology and the environment and how the two are linked. Topics may include how technology is both the cause of and solution to many environmental problems, the greenhouse effect, renewable energy vs. fossil fuels, recycling vs. landfill, the efficiency paradox, geo-engineering, and other related current topics.

4015 Technological Entrepreneurship surveys technological entrepreneurship via examples of both successful and failed businesses in technological fields. By examining cases of entrepreneurship, this course will examine challenges and opportunities facing technological entrepreneurs.

4016 Technical Problem Solving will introduce students to TRIZ, a powerful set of tools and algorithms developed specifically for analyzing and solving technological problems. TRIZ was developed by people with a technical background for those with a technical background. While TRIZ was developed for inventing and solving technological problems, the tools and approaches can be used to understand and solve virtually any solvable problem.

4020 Economic Management for Technologists (formerly Technology 4020) provides an introduction to the economics of technological projects. Students will study the mathematics of money, cost composition, and project evaluation, including cost comparison. They will also learn to analyze projects for decision making, including risk assessment and replacement analysis. In addition, they will learn to use suitable criteria for project selection, and to conduct sensitivity analysis.

4030 Technology in the Human Context (formerly Technology 4030) examines technology in the historical context and technology in the modern era. Students will discuss human insights, innovation, the interactions between development and technology transfer, ethics and professionalism and how to develop a technology value system.

4040 Project Management for Technologists (formerly Technology 4040) will introduce the student to the interdisciplinary field of project management. The course covers the interpersonal skills necessary to successfully lead or work effectively within a project team as well as providing an overview of certain planning and scheduling tools and techniques necessary for the planning and monitoring of projects.

4050 Introduction to Quality Management

4060 Advanced Technical Communications will enhance the technical communication skills of students. The course content examines technical writing fundamentals; information gathering, analysis, and documentation; proposal preparation; technical document applications; technical report preparation; graphics preparation; and technical presentations. The course will provide students with the knowledge and skills necessary to develop proposals, reports, and presentations for technical projects.

4070 Special Topics in Technology will provide the opportunity for students to maintain technical currency through a review of recent advances in technology and their application to particular technical areas.

PR: MSTM 4060

4090 Introduction to Technology will provide a broad survey of practices critical to operating a technology-based business. Topics covered may include an introduction to technology management, historical developments in the management of technology, the functions of technology management, and select current topics that are relevant to operating technology-based businesses.

410A/B is a two-semester linked course based on independent study of a problem involving the management of technology. The subject of study will be decided in consultation with the course instructor and must be approved by a committee. The student will identify a research topic in a specialty area, write a concept paper, develop a project proposal and write a report. The passing grade for this course is 65%.

CR: the former MSTM 4000, the former MSTM 4100, the former MSTM 4200, the former Technology 4090

OR: must be completed within three consecutive semesters
PR: MSTM 4060

Maritime Studies/Technology Management (MSTM) Courses Available to Students not Enrolled in a Degree Program Offered by the Fisheries and Marine Institute

Students not in a degree program offered by the Marine Institute may register in courses from the following list if space is available.

- 4001 The Organization and Issues of Shipping
- 4010 Assessment and Implementation of Technology
- 4030 Technology in the Human Context
- 4040 Project Management for Technologists
- 4050 Introduction to Quality Management
- 4060 Advanced Technical Communications
- 4070 Special Topics in Technology
- 4090 Introduction to Technology

PR: MSTM 4060
The Master of Marine Studies (Fisheries Resource Management) (M.M.S.) is a multi-disciplinary program of study that will provide the candidate with exposure to all dimensions of modern fisheries resource management in an international context. The program is aimed at professionals working in or intending to enter careers in fisheries management. The program is offered online and requires successful completion of either (a) 24 credit hours of course work and a Major Report, or (b) 30 credit hours of course work. Students who have successfully completed the requirements for the Graduate Diploma may elect to continue their program of study in order to earn the Degree.

1. Admission Requirements

a. Admission to the program is on a competitive basis. To be considered for admission to the program an applicant must normally have an undergraduate degree with a minimum of a high second-class standing from an institution recognized by Senate. Students who have successfully completed several years of post-secondary studies. Applicants who do not meet the minimum admission requirements shall be required to complete, with a high level of achievement, certain undergraduate courses before being considered for admission.

b. In exceptional cases, applicants who have not completed an undergraduate degree may be considered for admission. Preference will be given to those who have at least 10 years of relevant professional experience, and have successfully completed several years of post-secondary studies. Applicants who do not meet the minimum admission requirements shall be required to complete, with a high level of achievement, certain undergraduate courses before being considered for admission.

c. Applicants who did not complete a baccalaureate or post-graduate degree at a recognized university where English is the primary language of instruction must normally complete either:

i. Test of English as a Foreign Language (TOEFL) and achieve a paper-based score of 580 (or higher), computer-based score of 233 (or higher), or Internet based score of 92-93 (or higher); or

ii. International English Language Testing System (IELTS) and achieve a score of 7 (or higher)

Information regarding the TOEFL is available from the Educational Testing Service at www.ets.org. IELTS information is available at www.ielts.org. It is noted that other equivalent tests acceptable to the School of Graduate Studies will also be considered.

c. The deadlines for submission of applications for candidates wishing to enter studies are as follows:

   - Fall (September) Semester: June 15
   - Winter (January) Semester: October 15

2. Program of Study

a. Candidates for the Master of Marine Studies (Fisheries Resource Management) shall be required to complete a minimum of either:

i. 24 credit hours of course work plus a Major Report on the Course Work Plus a Major Report Route as described in accordance with General Regulations, Theses and Reports of the School of Graduate Studies. Course work must include the following course selections from the Courses section below:

   - 5 core courses (15 credit hours);
   - 1 elective course (3 credit hours) from Category A Electives
   - 1 elective course (3 credit hours) from Category B Electives
   - 1 elective course (3 credit hours) from either Category A or Category B

ii. 30 credit hours on a Comprehensive-Course Route which must include the following course selections from the Courses section below:

   - 5 core courses (15 credit hours);
   - 5 elective courses (6 credit hours) from either Category A Electives
   - 2 elective courses (6 credit hours) from either Category A or Category B

b. Dependent upon the applicant's academic background, other courses may be required by the Academic Advisory Committee.

c. Transfer of credit for graduate courses completed in other programs at the University or at other institutions recognized by Senate will be considered in accordance with School of Graduate Studies General Regulations, Transfer of Course Credits.

d. Those having partially completed the requirements for the degree under 2011-2012 Calendar Regulations may apply to transfer to one of the above programs options and will be considered in accordance with the following:

i. Those having previously completed all coursework required for the degree, but who have not submitted the Major Report, may satisfy the Comprehensive Course Route requirements by successfully completing 24 credit hours of courses required under previous program regulations, an additional elective course chosen from Category A or B must be selected in place of this course.

   - One further elective course (3 credit hours) from Category A or B Electives.

ii. Those having previously completed the coursework required for the degree may satisfy the Major Report Route requirements by successfully completing:

   - MSTM 6001 (or the former FRM 6001)
   - MSTM 6002 (or the former FRM 6002)
   - MSTM 6003 (or the former FRM 6003)
   - MSTM 6004 (or either of the former FRM 6004 or FRM 6005)
   - MSTM 6005 (or the former FRM 6009)

   - A Major Report completed in accordance with General Regulations, Theses and Reports of the School of Graduate Studies. Course work must include the following course selections from the Courses section below:

   - 1 elective course (3 credit hours) from Category A Electives
   - 1 elective course (3 credit hours) from Category B Electives
   - 1 elective course (3 credit hours) from either Category A or Category B

   - Those having previously completed the coursework required for the degree may satisfy the Comprehensive Course Route requirements by successfully completing:

   - MSTM 6001 (or the former FRM 6001)
   - MSTM 6002 (or the former FRM 6002)
   - MSTM 6003 (or the former FRM 6003)
   - MSTM 6004 (or either of the former FRM 6004 or FRM 6005)
   - MSTM 6005 (or the former FRM 6009)

   - A Major Report completed in accordance with General Regulations, Theses and Reports of the School of Graduate Studies together with the following course selections from the Courses section below:

   - 1 elective course (3 credit hours) from Category A Electives

   - Those having previously completed the coursework required for the degree may satisfy the Comprehensive Course Route requirements by successfully completing:

   - MSTM 6001 (or the former FRM 6001)
   - MSTM 6002 (or the former FRM 6002)
   - MSTM 6003 (or the former FRM 6003)
   - MSTM 6004 (or either of the former FRM 6004 or FRM 6005)
   - MSTM 6005 (or the former FRM 6009)

   - A Major Report completed in accordance with General Regulations, Theses and Reports of the School of Graduate Studies. Course work must include the following course selections from the Courses section below:

   - 1 elective course (3 credit hours) from Category A Electives
   - 1 elective course (3 credit hours) from Category B Electives

2.1. Course Work Plus a Major Report Route

24 credit hours of course work plus a Major Report on the Course Work Plus a Major Report Route completed in accordance with General Regulations, Theses and Reports of the School of Graduate Studies. Course work must include the following course selections from the Courses section below:

   - 5 core courses (15 credit hours)
   - 1 elective course (3 credit hours) from Category A Electives
2. Students intending to undertake electives in Decision Support / Geospatial Analysis (Category C) are required to have a background in mathematics, statistics and geographic information systems.

3. In exceptional cases, applicants who have not completed an undergraduate degree may be considered for admission. Preference will be given to those who have at least 10 years of relevant professional experience, and have successfully completed several years of post-secondary studies. Applicants who do not meet normal admission requirements shall be required to complete, with a high level of achievement, certain undergraduate courses before being considered for admission.

4. Applicants who did not complete a baccalaureate or post-graduate degree at a recognized university where English is the primary language of instruction must normally complete either the:
   • Test of English as a Foreign Language (TOEFL) and achieve a paper-based score of 580 (or higher), computer-based score of 237 (or higher), or Internet based score of 92-93 (or higher); or
   • International English Language Testing System (IELTS) and achieve a score of 7 (or higher).

Information regarding the TOEFL is available from the Educational Testing Service at www.ets.org. IELTS information is available at www.ielts.org. It is noted that other equivalent tests acceptable to the School of Graduate Studies will also be considered.

The deadline for submission of applications is March 15.

PROGRAM OF STUDY

Students in the Master of Marine Studies (Marine Spatial Planning and Management) are required to complete 30 credit hours of course work and an Internship or Research Project. Course work includes 7 core courses, 6 courses (18 credit hours) completed online; and 1 intensive hands-on course (3 credit hours) offered in a face-to-face environment, as well as 3 elective courses (9 credit hours) offered either online or on campus.

1) Core Courses

All students must complete the following compulsory core courses:

- MSTM 6011 Introduction to Integrated Coastal and Ocean Management / Marine Spatial Planning
- MSTM 6012 Fundamentals of Geospatial Analysis
- MSTM 6013 Resource/Natural Environment and Ocean Use Characterization
- MSTM 6014 Geospatial Analysis for Marine Spatial Planning (prerequisites: MSTM 6011, 6012, and 6013)
- MSTM 6022 Communication and Conflict Resolution in a Technical Environment
- MSTM 6034 Project Management in the Offshore, Health, Fisheries and Engineering Technology Environments
- MSTM 6027 Coastal and Ocean Environmental Policies
All students must complete an Internship or Research Project. Students will choose one of three options for elective course selection:

a) Category A Electives: Natural Environment
   - ENV/ENVS 6001 Earth and Ocean Systems
   - MSTM 6001 Fisheries Ecology
   - MSTM 6015 Marine Protected Areas
   - MSTM 6016 Coastal Geomorphology/Oceanography

b) Category B Electives: Human Environment
   - MSTM 6008 Social and Philosophical Issues in Sustainable Fisheries
   - MSTM 6017 Social and Cultural Aspects of Coastal Communities
   - MSTM 6018 Coastal and Ocean Economics

c) Category C Electives: Decision Support / Geospatial Analysis
   - GEOG 6120 Geospatial Modelling and Analysis
   - GEOG 6821 Advanced Computer Modelling/Habitat Mapping

3) Internship (MSTM 6019) or Research Project

All students must complete an internship or Research Project. Normally students would be permitted to register for the Internship or Research Project only after all other course requirements have been met, or during the student’s last semester of studies. Evaluation of the Research Project shall be carried out in accordance with Theses and Reports of the General Regulations governing all students in the School of Graduate Studies.

i. Internship Requirements
   - Internships are normally proposed by the student and approved by the Academic Director in consultation with the Placement Officer. Internship placements may be local, national or international. Students seeking international internships must consult with the Academic Director early in the first year of their program.
   - Internships are for full-time employment hours for the duration of the semester (12 weeks).
   - Students must attend a scheduled pre-internship orientation workshop. See Pre-Internship Workshop.
   - Each internship placement is supervised and evaluated by the on-site Supervisor assigned by the employer and the Academic Director. The internship shall consist of two components:
      - On-site Student Performance as evaluated by the on-site Supervisor assigned by the employer, in consultation with the Academic Director and Placement Officer.
      - An Internship Report graded by the Academic Director in consultation with the on-site Supervisor assigned by the employer.
   - Evaluation of the Internship shall result in one of the following grades: Pass or Fail.
      - A student must obtain a Pass in both the On-Site Student Performance and the Internship Report to obtain a final grade of Pass. If a student fails to achieve the internship standards specified above, the student may be required to repeat the internship. An internship may only be repeated once.
      - Students who voluntarily withdraw from the internship without prior approval of the Academic Director, or who conduct themselves in such a manner as to cause the host organization and the Placement Officer to terminate the placement, will normally be awarded a grade of Fail in the internship.
      - Students are not permitted to withdraw from the internship without prior approval of the Academic Director, in consultation with the Placement Officer. The Placement Officer will make a recommendation to the Academic Director who will make the final decision. Permission to withdraw from the internship does not constitute a waiver of degree requirements, and students who have obtained such permission must complete an approved internship or research project in lieu of the internship dropped.

ii. Research Project Requirements
   - Research projects are normally proposed by the student and approved by the Academic Director.
   - Students must attend a scheduled pre-research project orientation workshop. See Pre-Research Project Workshop.
   - Evaluation of the Research Project shall be carried out in accordance with Theses and Reports of the General Regulations governing all students in the School of Graduate Studies.
   - Students are not permitted to withdraw from the research project without prior approval of the Academic Director. Permission to withdraw from the research project does not constitute a waiver of degree requirements, and students who have obtained such permission must complete an approved research project or internship in lieu of the research project dropped.

The Master of Marine Studies (Marine Spatial Planning and Management) is a multi-disciplinary academic program that provides students with both conceptual/theoretical background and practical applied skills in integrated coastal and ocean management (ICOM) and marine spatial planning (MSP).

The program commences in the Fall semester of each year.

Students in the Master of Marine Studies (Marine Spatial Planning and Management) are required to complete 30 credit hours of coursework and an Internship or Research Project.

The Master of Marine Studies (Marine Spatial Planning and Management) is a multi-disciplinary academic program that provides students with both conceptual/theoretical background and practical applied skills in integrated coastal and ocean management (ICOM) and marine spatial planning (MSP).
Vice-President of Memorial University (Marine Institute)
G. Blackwood

Academic Director
J. Parsons

ADMINISTRATION

The Master of Maritime Management (MMM) program will be administered by an Academic Director appointed by the Vice-President (Marine Institute), together with an Academic Advisory Committee.

An Academic Advisory Committee will be appointed by the Dean of Graduate Studies on recommendation of the Vice-President (Marine Institute). This committee will consist of the Academic Director as Chair, three members from the Marine Institute, one member from the Faculty of Business Administration and one member from another unit of the University. Normally, all appointments will be for a period of three (3) years.

A Technical Advisory Committee, consisting of a cross-section of members with professional expertise related to the maritime sector, will provide regular feedback on program content, instruction, and future direction of the Program. Members of this Committee will be appointed by the Dean of Graduate Studies on recommendation of the Vice-President (Marine Institute). The Academic Director will be an ex officio member and Chair of the Technical Advisory Committee. Normally all appointments will be for a period of three (3) years.

PROGRAM

The Master of Maritime Management (MMM) is a comprehensive academic program that provides a broad understanding of the structure and operation of organizations and the factors that influence business decisions in the context of maritime-based organizations. It provides a maritime management focus through the development of knowledge and understanding of the nature of technical operations and the factors that have an impact on their success, as well as the ability to apply these concepts within their organizations.

The program is offered online and requires successful completion of either (i) 24 credit hours of course work and a comprehensive project and report (6 credit hours), or (ii) 30 credit hours of course work. Candidates will typically register on a part-time basis.

ADMISSION REQUIREMENTS

1. Admission to the program is on a competitive basis. To be considered for admission to the program an applicant will normally possess:
   - A Bachelor of Technology in Marine Operations, Management, or a comparable undergraduate degree from a university of recognized standing and will normally have:
     - A Memorial Bachelor of Maritime Studies or Bachelor of Technology, or a comparable undergraduate degree with appropriate maritime sector and business management course work.
     - Appropriate technical knowledge and relevant marine-sector employment experience.
   - The deadlines for submission of applications for candidates wishing to enter studies are as follows:
     - Fall (September) Semester: September 15
     - Winter (January) Semester: January 15
     - Spring (May) Semester: May 15

2. In exceptional cases, applicants who have not completed an undergraduate degree, but who meet all other requirements, may be considered for admission. Preference will be given to those who have at least 10 years of relevant professional and managerial experience, and have successfully completed several years of post-secondary studies. Applicants who do not meet normal admission requirements shall be required to complete, with a high level of achievement, certain undergraduate courses before being considered for admission.

3. Applicants who did not complete a baccalaureate or post-graduate degree at a recognized university where English is the primary language of instruction must normally complete either the:
   - Test of English as a Foreign Language (TOEFL) and achieve a paper-based score of 580 (or higher), computer-based score of 237 (or higher), or Internet based score of 92-93 (or higher); or
   - International English Language Testing System (IELTS) and achieve a score of 7 (or higher). Information regarding the TOEFL is available from the Educational Testing Service at www.ets.org. IELTS information is available at www.ielts.org. It is noted that other equivalent tests acceptable to the School of Graduate Studies will also be considered.

4. Students will choose a topic in consultation with the Academic Director and will work independently to carry out an in-depth study of a problem or application within the area of maritime management and fully document and present their findings. Preferably the problem will be directed to a workplace situation.
   - 30 credit hours on a course-based route. Course work includes two compulsory core courses (6 credit hours); and eight elective courses (24 credit hours).
   - 30 credit hours on a course-based route. Course work includes two compulsory core courses (6 credit hours); and eight elective courses (24 credit hours).

5. Students may be transferred from other graduate programs within the School of Graduate Studies or from other post-secondary institutions recognized by Senate, subject to the approval of the Dean of Graduate Studies, substitute another graduate course. Only one course repetition or substitution will be permitted during the candidate’s program after which the candidate shall be required to withdraw from the program.

6. Students who will complete the Master of Maritime Management Degree must obtain a grade of B or better in all program courses.

7. Candidates who receive a grade of less than B in any course will be permitted to remain in the program provided the course is repeated and passed with a grade of B or better. Alternatively, the candidate may, on the recommendation of the Academic Director, and with the approval of the Dean of Graduate Studies, substitute another graduate course. Only one course repetition or substitution will be permitted during the candidate’s program after which the candidate shall be required to withdraw from the program.

8. Students who complete the Master of Maritime Management Degree must complete a Research Project (6 credit hours). Students will choose a topic in consultation with the Academic Director and will work independently to carry out an in-depth study of a problem or application within the area of maritime management and fully document and present their findings. Preferably the problem will be directed to a workplace situation.
3. To be considered for admission to the Aquaculture Technology Option an applicant will normally possess a second class or better undergraduate degree from a university of recognized standing and will normally have:
   • a post-graduate aquaculture credential or an aquaculture focus in their undergraduate degree; or significant professional experience in the aquaculture industry; and
   • a minimum of two (2) years relevant employment experience.
4. In exceptional cases, applicants who have not completed an undergraduate degree, but who meet all other requirements, may be considered for admission. Preference will be given to those who have significant and relevant professional experience, and have successfully completed several years of post-secondary studies. Applicants who do not meet normal admission requirements shall be required to complete, with a high level of achievement, certain undergraduate courses before being considered for admission.
5. Applicants who did not complete a baccalaureate or post-graduate degree at a recognized university where English is the primary language of instruction must normally complete either the:
   • Test of English as a Foreign Language (TOEFL) and achieve a paper-based score of 580 (or higher), computer-based score of 237 (or higher), or Internet based score of 92-93 (or higher); or
   • International English Language Testing System (IELTS) and achieve a score of 7 (or higher).
   Information regarding the TOEFL is available from the Educational Testing Service at www.ets.org. IELTS information is available at www.ielts.org. It is noted that other equivalent tests acceptable to the School of Graduate Studies will also be considered.
6. Upon acceptance into the program, students will be admitted to one of the two Options: the Engineering and Advanced Science Technology Option or the Aquaculture Technology Option.

ADMISION REQUIREMENTS
Admission to the program is on a competitive basis.
1. The deadlines for submission of applications are as follows:
   • Fall (September) semester: May 15
   • Winter (January) semester: September 15
2. To be considered for admission to the Engineering and Applied Science Technology Option an applicant will normally possess a second class or better undergraduate degree from a university of recognized standing and will normally have:
   • a Memorial University of Newfoundland Bachelor of Technology, Bachelor of Maritime Studies, or a comparable undergraduate degree with appropriate technology sector and business management course work; and
   • a minimum of two (2) years relevant employment experience.
3. To be considered for admission to the Aquaculture Technology Option an applicant will normally possess a second class or better undergraduate degree from a university of recognized standing and will normally have:
   • a post-graduate aquaculture credential or an aquaculture focus in their undergraduate degree; or significant professional experience in the aquaculture industry; and
   • a minimum of two (2) years relevant employment experience.

PROGRAM OF STUDY

Masters of Technology Management - Engineering and Applied Science Technology Option
1. Candidates for the Master of Technology Management (Engineering and Applied Science Technology Option) shall be required to complete a minimum of either:
   a. 24 credit hours of course work and a major project and report (6 credit hours). Course work includes two compulsory core courses (6 credit hours); and six elective courses (18 credit hours). Students on the project route will complete MSTM 6100: Project in Engineering and Applied Science Technology Management (6 credit hours).
   b. 30 credit hours on a comprehensive-course route. Course work includes two compulsory core courses (6 credit hours); and eight elective courses (24 credit hours).
Core Courses (Two to be completed):
- MSTM 6031 Overview of Technical Operations
- MSTM 6032 Managing Technological Innovation

Elective Courses (Six to be completed including at least three from Category B):

Category A
- MSTM 6022 Communication and Conflict Resolution in a Technical Environment
- MSTM 6023 Strategic Planning, Policy, Participation and Management in Technical Operations
- MSTM 6033 Quality Systems
- MSTM 6034 Project Management in the Offshore, Health, Fisheries and Engineering Technology Environments
- MSTM 6037 Risk Analysis and Operations in the Engineering Technology Sector

Category B
- MSTM 6071 Management of Aquaculture Technology
- MSTM 6072 Animal Husbandry Management
- MSTM 6073 Aquaculture Environmental Management
- MSTM 6074 Aquaculture Site and Operational Assessment
- MSTM 6075 Aquaculture Engineering Technology Management

2. Up to three relevant elective courses (9 credit hours) may be transferred from other graduate programs within the School of Graduate Studies or from other post-secondary institutions recognized by Senate, subject to the approval of the Dean of Graduate Studies on the recommendation of the Academic Director.

Program Entry
Please refer to the Admissions Section of this Calendar.

Program Structure
This is a four-year program that incorporates all the elements of a diploma of technology along with the courses to complete the Bachelor of Technology. It consists of 8 semesters, a technical session and 2 work terms.

Program Highlights
Students completing our four-year food technology program will earn both a Diploma of Technology in Food Technology and a Bachelor of Technology Degree.

The integrated diploma-degree provides our students with the opportunity to complete the Diploma of Food Technology program, which retains the technical focus important for job entry in the food technology sector; concurrently with the requirements for a Bachelor of Technology degree that emphasizes the theory behind technological applications. Students will experience a range of teaching methods including lectures, tutorials, workshops, laboratories, seminars and study tours.

Program Outline
TERM 1
- BIOL 1100 (Biology)
- CHEM 1101 (General Chemistry I)
- CMSK 1102 (Technical Communications)
- ENGR 1103 (Engineering Graphics)
- MATH 1100 (Pre-Calculus I)
- PHYS 1100 (Physics)

TERM 2
- CHEM 1201 (General Chemistry II)
- CMSK 1201 (Communication at Work)
- CPSK 1103 (Computer Database and Spreadsheet Applications)
- FOTE 1100 (Introduction to Food Science and Technology)
- MATH 1101 (Calculus)
- PHYS 1200 (Physics)

TERM 3
- BIOL 2105 (Microbiology)
- BSMG 1200 (Introduction to Business)
- CHEM 2103 (Organic Chemistry)
- FOTE 2105 (Nutrition)
- FOTE 2112 (Food Hygiene and Food Safety)
- MATH 2100 (Calculus)
- WKT 11002 (Work Term Preparation Seminar)

TERM 4
- BSMG 2209 (Product Development)
- BSMG 3118 (Technical Problem Solving)
- CHEM 3102 (Biochemistry)
- CHEM 3200 (Physical Chemistry)
- FOTE 2202 (Food Processing I)
- FOTE 2118 (Canned Food and Thermal Processing)
- FOTE 3102 (Food Safety Enhancement Program/Hazard Analysis Critical Control Point)
- FOTE 3104 (Quality Management Program)
- FOTE 3108 (Global Food Safety Initiatives)
- QLAS 2104 (Food Evaluation)

TERM 5
- BIOL 2202 (Food Microbiology)
- ENGL 1080 (Critical Reading and Writing I)
- FOTE 2103 (Food Engineering Principles)
- FOTE 3106 (Seafood Processing Technology)
- QLAS 3101 (Quality Assurance)
- B.Tech Elective
JOINT DIPLOMA OF TECHNOLOGY/BACHELOR OF TECHNOLOGY - FOOD TECHNOLOGY

TERM 6
CHEM 3100 (Food Chemistry)
FDTE 3107 (Food Processing II)
MSTM 4030 (Technology in the Human Context)
MSTM 4050 (Introduction to Quality Management)
MSTM 4060 (Advanced Technical Communications)
STAT 2108 (Applied Statistics)

WORK TERM II
WKTM 3301 (Work Term 2 - Food Technology)

TERM 7
CHEM 3101 (Food Analysis)
FDTE 3101 (Food Biotechnology)
MSTM 4010 (Assessment and Implementation of Technology)
MSTM 4040 (Project Management for Technologists)
MSTM 4070 (Special Topics in Technology)
MSTM 410A (Technical Project and Report I)

TERM 8
BSMG 3500 (Fundamentals of Canadian Food Laws and Regulations)
FDTE 3100 (Food Engineering - Unit Operations)
MSTM 4020 (Technology in the Human Context)
MSTM 4070 (Advanced Technical Communications)
WTERM II
MSTM 410A (Technical Project and Report II)

CAREERS
The Food Technology program will produce a graduate who has combined skills in chemistry, nutrition, microbiology, engineering, processing, quality assurance and business management; one who is well qualified to work in many aspects of the food industry as well as in government. With two work terms built into the program, our students graduate with experience in their chosen field that will help them gain employment.

MISSION
The Ocean Mapping Program is designed to:
• Prepare graduates to enter the workforce with an advanced level of technological literacy and competency with respect to marine technology.
• Immerses students in both the theory and practical aspects of marine technology, allowing for a seamless transition from the classroom to the real world.
• Provide the students with the necessary expertise in all aspects of Ocean Mapping, including the collection, processing and management of physical, biological and chemical data pertaining to the ocean.
• Integrate and apply the use of satellite imagery and other methodologies to determine the many parameters in the ocean.
• Develop the skills to design, develop, store, analyze manage and disseminate spatial and attribute information within a Geographic Information System (GIS).
• Examine the ocean cube – comprised of the surface, water column, seabed and seabed subsurface.
• Operate and troubleshoot traditional and industrial standard marine surveying equipment within relevant working environments.
• Operate and troubleshoot oceanographic instrumentation equipment within relevant working environments, both land and sea.
• Utilize electromagnetic and acoustic remote sensing technologies for advanced analysis of marine data.
• Design, develop and manage Geographic Information Systems (GIS) from the developer, analyst, Information Technology (IT), manager and end-user perspectives.

Main Areas of Study
The first year of the Ocean Mapping program is similar to the common first year structure of other programs at the Marine Institute, with the inclusion of some program specific areas of study. All students will complete core courses in Mathematics, Physics, Chemistry and Electrotechnology. Additionally, students will:
• Complete a communication skills course designed specifically for the School of Ocean Technology pertaining to technical report writing in semester one.
• Complete a course covering the fundamentals of oceanography in semester one.
• Complete a short safety course in WHMIS in semester one.
• Complete a course covering the fundamentals of underwater acoustic applications in semester two.
• Following semester two, a six-week technical session will be completed whereby the students become actively engaged in the practical application of ocean mapping technology in the fields of Hydrography, Tides, Global Positioning Systems (GPS), Surveying and Oceanographic Instrumentation. Some of the practical elements associated with data acquisition will be performed at sea on a Marine Institute vessel.
• Students will also complete a specialized math course focusing on spherical trigonometry as well as two courses that focus on general seamanship and security awareness while performing duties on a vessel at sea.

The second year of the Ocean Mapping program marks the beginning of a more concentrated effort towards the theory and application of Geographic Information Systems (GIS), Remote Sensing, Terrestrial Surveying and Hydrographic Surveying, with emphasis placed on the utilization of ocean and ocean-related data. Students will:
• Complete introductory courses in Geographic Information Systems (GIS), Marine Geology and Geophysics, Intermediate Surveying Practices and Advanced Tides and Water Levels along with a communication skills course covering relevant soft skills concepts applied in ocean technology in semester three. This semester also marks the point in the program where students begin enrolling in the Bachelor of Technology (B. Tech) courses required for the Degree.
• Complete introductory courses in Optical Remote Sensing, Computer Networking, Sidescan Sonar and Geophysical Remote Sensing and Multibeam Sonar in semester four, which focuses on the theory and practical application of the technology in terms of data collection techniques, installation and deployment, data analysis interpretation and dissemination. Students will also complete a Linear Algebra course along with a Bachelor of Technology course as required for the Degree.
• Following semester four, a six-week technical session will be completed whereby the students become actively engaged in intermediate techniques associated with field data collection, system design, implementation techniques and best practices utilized for data processing and visualization. In addition, students will also complete a series of short courses associated with Marine Safety, including STCW-Basic Safety, Restricted Operator’s Certificate, and Marine Basic First Aid, all of which are essential when working within a marine environment.

The third year of the Ocean Mapping program marks the beginning of the more advanced ocean mapping techniques whereby students learn methods and techniques used in the fields of data design and management as well as overall system integration and performance. Students will:
• Complete a communication skills course designed specifically for the School of Ocean Technology pertaining to technical report writing in semester one.
• Complete a course covering the fundamentals of oceanography in semester one.
• Complete a short safety course in WHMIS in semester one.
• Complete a course covering the fundamentals of underwater acoustic applications in semester two.
• Following semester two, a six-week technical session will be completed whereby the students become actively engaged in the practical application of ocean mapping technology in the fields of Hydrography, Tides, Global Positioning Systems (GPS), Surveying and Oceanographic Instrumentation. Some of the practical elements associated with data acquisition will be performed at sea on a Marine Institute vessel.
• Students will also complete a specialized math course focusing on spherical trigonometry as well as two courses that focus on general seamanship and security awareness while performing duties on a vessel at sea.

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• Complete introductory courses in Geographic Information Systems (GIS), Marine Geology and Geophysics, Intermediate Surveying Practices and Advanced Tides and Water Levels along with a communication skills course covering relevant soft skills concepts applied in ocean technology in semester three. This semester also marks the point in the program where students begin enrolling in the Bachelor of Technology (B. Tech) courses required for the Degree.
• Complete introductory courses in Optical Remote Sensing, Computer Networking, Sidescan Sonar and Geophysical Remote Sensing and Multibeam Sonar in semester four, which focuses on the theory and practical application of the technology in terms of data collection techniques, installation and deployment, data analysis interpretation and dissemination. Students will also complete a Linear Algebra course along with a Bachelor of Technology course as required for the Degree.
• Following semester four, a six-week technical session will be completed whereby the students become actively engaged in intermediate techniques associated with field data collection, system design, implementation techniques and best practices utilized for data processing and visualization. In addition, students will also complete a series of short courses associated with Marine Safety, including STCW-Basic Safety, Restricted Operator’s Certificate, and Marine Basic First Aid, all of which are essential when working within a marine environment.

The third year of the Ocean Mapping program marks the beginning of the more advanced ocean mapping techniques whereby students learn methods and techniques used in the fields of data design and management as well as overall system integration and performance. Students will:
The Ocean Mapping Program is a four-year program that prepares students for employment within the marine environment. The program is designed to link all the concepts attained through the maturation process of the program. Successful graduates of the Ocean Mapping Program will have a proven work ethic and an excellent understanding of all aspects of ocean mapping technology, preparing them for employment within a variety of fields within ocean mapping.

**Characteristics of Graduates:**
- Successful graduates of the Ocean Mapping Program will have a proven work ethic and an excellent understanding of all aspects of ocean mapping technology, preparing them for employment within a variety of fields within ocean mapping.
- **Accreditation Status:**
  - The Ocean Mapping Program has successfully attained international recognition under the International Hydrographic Organization (IHO) as a Category B Hydrographic Surveyor program, making the program accepted and recognized worldwide. Also, the Ocean Mapping Program is in the process of attaining national accreditation under the Canadian Technology Accreditation Board (CTAB) for national recognition in the field of Surveying and Geomatics at the technologist level. The Ocean Mapping Program is a Joint Diploma / Degree program and has incorporated Bachelor of Technology components from Memorial University of Newfoundland and Labrador (MUN), indicating its Degree recognition. Additional accreditation will be pursued and attained through the maturation process of the program.

**PROGRAM ENTRY**
As per the Marine Institutes minimum entrance requirements for Diploma of Technology Programs. Refer to the Admissions Section of the Marine Institute Calendar.
- **Subjects** should possess strong skills in both mathematics and science to enter this program.

**PROGRAM STRUCTURE**
The Ocean Mapping Program is a four-year program that consists of:
- Eight (8) thirteen-week academic terms
- Three (3) six-week technical sessions and One (1) work term.
- Seventy (70) courses

**PROGRAM OUTLINE**

<table>
<thead>
<tr>
<th>TERM 1</th>
<th>CHEM 1100 (Chemistry)</th>
<th>CMSG 1104 (Introduction to Technical Reporting)</th>
<th>ELTK 1100 (Electrotechnology)</th>
<th>MATH 1100 (Pre-Calculus)</th>
<th>MATH 1101 (Introduction to Calculus)</th>
<th>ONGR 1200 (Descriptive Oceanography)</th>
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</thead>
<tbody>
<tr>
<td>TERM 2</td>
<td>CHEM 1200 (Chemistry)</td>
<td>CPSK 1102 (Introduction to Programming)</td>
<td>ELTK 1200 (Electrotechnology)</td>
<td>MATH 1200 (Calculus)</td>
<td>OMAP 2000 (Underwater Acoustics Applications)</td>
<td>PHYS 1200 (Physics)</td>
</tr>
<tr>
<td>TERM 3</td>
<td>GEOG 1301 (Surveying and GPS)</td>
<td>MATH 2204 (Spherical Trigonometry)</td>
<td>NASC 1304 (Seamanship for Ocean Technology Technicians)</td>
<td>ONGR 1301 (Instrumentation Oceanography)</td>
<td>ONGR 3002 (Hydrography and Tides)</td>
<td>SFTY 1134 (Security Awareness Training for Seafarers without Designated Security Duties)</td>
</tr>
<tr>
<td>TERM 4</td>
<td>ELTK 2118 (Introduction to Computers and Networking)</td>
<td>ENGLISH 1000 Level Course</td>
<td>GEOG 2101 (Intermediate Surveying Practices)</td>
<td>GEOG 2102 (Mapping and GIS)</td>
<td>OMAP 3500 (Advanced Tides and Water Levels)</td>
<td>ONGR 2107 (Marine Geology and Geophysics)</td>
</tr>
<tr>
<td>TERM 5</td>
<td>NASC 2107 (ROC-MC)</td>
<td>OMAP 2200 (Sidescan Sonar and Geophysical)</td>
<td>MSTM 4090 (Introduction to Technology)</td>
<td>MSTM 4090 (Advanced Technical Communications)</td>
<td>OMAP 3100 (Shipboard System Integration)</td>
<td>OMAP 3101 (System Performance)</td>
</tr>
</tbody>
</table>

**PHYSICAL REQUIREMENTS**
Students will be required to pass a Marine Institute medical.

**EVALUATION**
Evaluation of the Ocean Mapping Program will occur on a regular basis to ensure that all academic and accreditation criteria have been met and to ensure that the program is designed and implemented to represent the optimum education stream for the students, faculty, school and Institute.
CAREERS

Types of companies graduate will find work
- Graduates of this program are expected to avail of careers in a variety of areas, ranging from the private sectors and consultant agencies, provincial and federal government departments as well as educational and research institutions. One of the great aspects of the program is that graduates can seek employment either at sea or ashore or a combination of both because the knowledge and expertise they have attained will apply to both environments. Graduates may find themselves at sea on a survey vessel operating equipment to collect process and analyze information. Many opportunities also exist where graduates can work ashore in a scientific capacity, analyzing and presenting data.

Types of job titles
- Ocean Mapper
- Spatial Database Analyst
- GIS Technician / Specialist
- Web Developer
- Systems Analyst
- Remote Sensing Specialist
- Instrumentation Oceanographer
- Applied Researcher
- Project Manager
- Computer Network Specialist

Location
Locally (Newfoundland and Labrador), Nationally (Canada), and Internationally (Worldwide)

SAMPLE JOB DESCRIPTION

• Typical activities for an Ocean Mapper graduate as follows:

Hydrographic Surveyor
- Ability to undertake industrial activities including the precise positioning, data acquisition, processing, analysis, management and dissemination of marine environments
- Ability to measure and map the sea-surface, water column, seafloor and seafloor substrate
- Ability to utilize software and equipment relating to satellite and terrestrial positioning, single beam echo sounders, multibeam echo sounders, laser scanners, Lidar and SideScan Sonar for the production of nautical charts and maps
- Ability to utilize remotely operated (ROV) and autonomous (ALV) underwater vehicles for hydrographic data acquisition
- Ability to manage projects and produce reports
- Ability to provide accurate and reliable information for other disciplines such as navigation, dredging, environmental monitoring, oils and gas and oceanographic research
- Ability to work as a team of technical specialists

Remote Sensing Specialist
- Competence in using ArcGIS Desktop and Server including processing and manipulation of a wide variety of spatial data, building databases, spatial analysis, 3D visualizations & map production
- Experience in Remote Sensing techniques, such as classification, feature extraction and image analysis using Idrisi Taiga software or equivalent
- Competence in digital Photogrammetry and orthophoto production, preferably using PCI Geomatica or equivalent
- Familiarity with sub-meter GPS applications, including data acquisition and post-processing
- Abilities in a relevant language such as C++, Python etc
- Experience with web approaches, interfaces, & protocols such as html, xml, css, php, etc
- Familiarity with implementation of OGC compliant standards such as WMS, WFS, etc
- Sound understanding of computer networking, client-server and database technologies

Spatial Database Administrator
- Experience with Oracle or SQL Server installation, configuration and administration, with strong abilities using either Oracle Spatial or SQL Server Geography and Geometry data types.
- Spatial Database Backup and Recovery
- Archive Log Management
- ESRI ArcSDE tuning and configuration
- Strong understanding of the geodatabase, including the types and their usage
- Experience with raster and vector data loading with change control and optimization
- Ability to install and configure a Windows environment
- Ability to design, configure and maintain a spatial data warehouse
- Ability to handle large quantities of data in a seamless environment

GIS Technician / Specialist
- Work with the project management team to plan and implement new systems within a marine environment
- Deploy marine applications onto web servers and configure systems based on identified requirements.
- Maintain a high implementation quality standard through attention to detail and thorough review and testing procedures.
- Deliver written material as need to summarize implementations, report on status or provide clients with how-to instructions.
- Support existing client implementations by troubleshooting and diagnosing issues, providing clients with guidance and feedback and applying hot fixes where necessary.
- Provide technical guidance regarding the implementation of ArcGIS Server and integration requirements within marine-based solutions.
- Install and manage ArcGIS Server systems
- Work with clients on the configuration of Map Services, layer definitions, cartography, thematic map definitions, and map server performance tuning.
- Process/prepatt data for web sites, configure map server settings, and create static HTML content.

Download the PDF version for easier reading.
Term 6 is followed by the 6 week Technical Session 2 in which students receive hands-on experience piloting ROVs in open water and honing those skills in the simulator. This technical session also includes marine safety training required to work in the offshore industry.

- Following Technical Session 2, prior to Year Four, students will complete an 8 week (320 hour) work term in the local or international ROV industry. The work term can also be completed following Year 4 if necessary.

Characteristics of Graduates
- Successful graduates will have a proven work ethic and an excellent understanding of ROV/AUV operations and design including piloting, hydraulics and work safety preparing them for initial employment as a ROV/AUV operator/designer.

Accreditation Status
- The BTech (UV) program is accredited under the Dublin Accord by the Canadian Technology Accreditation Board (CTAB).
- Graduates are recognized by the Diver Certification Board of Canada (DCBC) and are eligible to register with DCBC as an ROV Operator.

Program Entry
Students admitted to the B Tech (UV) program must meet the requirements for both Memorial University and the Marine Institute. They are also required to successfully complete and maintain a CAPP (Canadian Association of Petroleum Producers) medical.

Program Overview
The Underwater Vehicle program is designed to prepare graduates to enter the workforce with a sound background in electronics, hydraulics, and workplace safety.

Main Areas of Study
- In the first year, students begin studying math, physics, chemistry, marine technology, digital logic, and computer programming. ROV systems are introduced as well as courses in oceanography, fluid mechanics, and ROV electronics. Written communication and computer programming is another feature of this first year.
- The second year focuses on ROV operations and maintenance. It covers advanced hydraulics, industrial electronics & controls, underwater acoustics, and electrical machines, maintenance, and safety. A workshop practice course adds a practical dimension to the theoretical knowledge. ROV launch, recovery, and maintenance duties form a major part of work for the graduates in the ROV industry. On the operational side, computer interfacing techniques, data communication, and acoustics applications help in understanding the interconnected systems that comprise an ROV.
- Following Term 4, the 6 week Technical Session 1 teaches hands-on experience with electronic and mechanical fabrication and drafting, instrumentation used on ROVs, and ROV piloting via simulators. A basic seamanship course introduces students to life at sea.
- Year Two and Three of the UV program build on the ROV pilot fundamentals to extend their knowledge to include ROV and AUV Design. It also includes study in advanced electronics, mechanics and system design. At the same time students are introduced to business and management skills as part of the Bachelor of Technology degree.
- Term 6 is followed by the 6 week Technical Session 2 in which students receive hands-on experience piloting ROVs in open water and honing those skills in the simulator. This technical session also includes marine safety training required to work in the offshore industry.
- Following Technical Session 2, prior to Year Four, students will complete an 8 week (320 hour) work term in the local or international ROV industry. The work term can also be completed following Year 4 if necessary.

Characteristics of Graduates
- Successful graduates will have a proven work ethic and an excellent understanding of ROV/AUV operations and design including piloting, hydraulics and work safety preparing them for initial employment as a ROV/AUV operator/designer.

Accreditation Status
- The BTech (UV) program is accredited under the Dublin Accord by the Canadian Technology Accreditation Board (CTAB).
- Graduates are recognized by the Diver Certification Board of Canada (DCBC) and are eligible to register with DCBC as an ROV Operator.

Program Outline

**TERM 1**
- **CMST 1104** (Introduction to Technical Reporting)
- **MATH 1101** (Introduction to Calculus)
- **ELTR 2102** (Digital Logic)
- **ELTK 1103** (Introduction to Electrotechnology Applications)
- **ONGR 1200** (Descriptive Oceanography)
- **SFTY 1104** (WHMSI)

**TERM 2**
- **CHEM 1100** (Chemistry)
- **FLOD 2108** (Introduction to Fluid Mechanics & Hydraulics)
- **CPN 1102** (Introduction to Programming)
- **ELTR 1301** (Control Electronics for ROV)
- **PHYS 1101** (Physics)
- **ROVO 2200** (Introduction to ROV Systems)

**TERM 3**
- **CMST 2103** (Soft Skills for Ocean Technology Technicians)
- **ELTK 1303** (Electrical Machines & Power Systems)
- **ELTK 2118** (High Voltage Safety)
- **FLOD 2109** (Advanced Hydraulics)
- **MATH 1200** (Calculus)
- **ROVO 2201** (ROV Operations)
- **WKPR 2118** (Workshop Practice)

**TERM 4**
- **ELTR 2116** (Industrial Electronic and Controls)
- **ELTR 2115** (Data Communications)
- **ELTR 2215** (Microcomputer Interfacing)
- **ELTR 2200** (Marine Electrical Troubleshooting)
- **OMAP 2000** (Underwater Acoustic Applications)
- **ROVO 2205** (ROV Maintenance and Recovery Systems (LARS))

**TECHNICAL SESSION 1**
- **ENG 1303** (ROV Drafting and Blueprints)
- **ELTR 1104** (Electronic Fabrication Techniques)
- **NASC 1304** (Seamanship for Ocean Technology Technicians)
- **ONGR 1301** (Instrumentation Oceanography)
- **ROVO 1300** (ROV Simulator - Introduction)
- **ROVO 1301** (ROV Tooling)
- **WKPR 1308** (Computer Numerical Controlled (CNC) Fabrication)

**TERM 5**
- **ELTR 2202** (Analogue Transistor Circuits)
- **ELTR 3122** (Embedded Controllers)
- **ENGR 1000** Level Course
- **MATH 1200** (Calculus)
- **MSTM 4014** (Technology and the Environment)
- **MSTM 4000** (Introduction to Technology)
CAREERS
Remotely Operated Vehicles (ROV) and Autonomous Underwater Vehicles (AUV) are used most notably in the offshore oil and gas, nuclear, military, law enforcement, pipeline, and cable industries, as a substitute or supplement to commercial (manned) diving operations. These vehicles are especially suited for hazardous and difficult underwater operations. Due to the increased complexity in ROV/AUV operations, offshore operators have started to demand a higher level of quality assurance for ROV operators. Skills required by ROV/AUV operators include piloting, maintenance of hydraulics, electronics, and electrical systems, and general workplace safety.

Types of companies graduates will find work in:
- Graduates of the program typically find work in AUV/ROV manufacturing companies, marine offshore industries, nuclear, military, law enforcement, and pipeline and cable industries.

Types of job titles
See sample job description

Location
The industry is a global one and graduates should expect to work in various locations around the world.

SAMPLE JOB DESCRIPTION
ROV Pilot/Technician
- Perform electrical, electronic, hydraulic and mechanical maintenance and repair duties for a multitude of electro/hydraulic/mechanical systems.
- Perform piloting duties for a multitude of subsea tasks including general visual inspections, survey, specialty tooling operation, construction, installation, pipeline and cable laying, search, salvage and recovery, and offshore oil drilling support.
- Perform support duties including navigation and sonar operation, multimedia recording and record keeping, manipulator operation, inventory, planned and preventative maintenance, updating system specifications, logs and registers.
- Opportunity to work globally.

ROV Supervisor
- Act as team lead for operation, maintenance, and repair of Remotely Operated Vehicles.
- Plan ROV missions.
- Act as liaison between ROV crew and vessel.
- Accept responsibility for safe and effective ROV operations.
- Accept responsibility for documentation of ROV operations.
- Participates in daily planning of offshore installation activity.

ROV Superintendent
- Engage in project planning for acquisition and deployment of Remotely Operated Vehicles and crews.
- Interface with clients to determine ROV requirements and activity.
- Present clients with optimal operational scenarios.
- Interact with ROV Supervisor to ensure efficient operations.

PROGRAM ENTRY
Please refer to the Admissions Section of this Calendar.

PROGRAM STRUCTURE
Food Safety consists of four courses: one required (core) course and three electives chosen from an approved list with at least two electives selected from category A. Learning online will allow you to interact with a virtual community consisting of other food industry professionals and your instructor.

Required Course:
- MIPG 4113 (Introduction to Food Safety)

Category A Elective Courses
- MIPG 4102 (Food Safety Systems)
- MIPG 4114 (Fundamentals of Canadian Food Laws and Regulations)
- MIPG 4115 (Foodborne Illness and Food Toxicology)
- MIPG 4116 (Food Sanitation)

Category B Elective Courses
- MIPG 4100 (Quality Management)
- MIPG 4104 (Quality Assurance in the Food Industry)
- MIPG 4105 (Introduction to Process Control)
- MIPG 4106 (Project Management Fundamentals)
- MIPG 4107 (EU Food Law)
- MIPG 4108 (ISO Management Systems)

The elective course selection will expand to include a wide range of disciplines as the program progresses.

PROGRAM HIGHLIGHTS
This is a post-graduate-level program designed for students with a background in science or technology to gain knowledge of food safety. After completing the program, students will have gained an understanding of food safety principles and how they can be applied to their particular area of industry. Graduates from the program are expected to avail of careers in the private and public sectors.

COURSE DESCRIPTIONS
MIPG 4100M - Quality Management - Practitioners in corporate settings will find the course a useful guide in understanding and implementing total quality in existing organizations. The course focuses primarily on the theories, principles, and various elements within the total quality approach to quality management.

Total Quality Approach to Quality Management; Quality and Global Competitiveness; Strategic Management; Planning and Execution for Competitive Advantage; Quality Management, Ethics & Corporate Social Responsibility; Partnering and Strategic Alliances; Quality Culture; Leadership and Change; Customer Satisfaction, Retention, and Loyalty; Employee Empowerment; Team Building and Teamwork; Effective Communication; Education and Training; ISO 9000 and Total Quality; The Relationship; Overview of Total Quality Tools; Continual Improvement; Implementing Total Quality

Schedule - Web-based instruction: 39 hours

MIPG 4102M - Food Safety Systems - This course is designed to provide participants with an understanding of the various food safety systems that exist within the Canadian food industry. Food Law; Food Plant Sanitation; Hazard Analysis Critical Control Point; Food Safety Enhancement Program; Quality Management Program; Food Recalls; Food Security; Food Traceability

Schedule - Web-based instruction: 39 hours

MIPG 4104M - Quality Assurance in the Food Industry - This course is designed to provide participants with an understanding of the various elements necessary in the design and implementation of a quality assurance program for the food industry.

Quality and the Food Industry; Quality Assurance Program; Specifications; Raw Material/Ingredient Supplier Certification; Process Control; Product Quality Audits; Quality Assurance Documentation System; ISO and the Food Industry

Schedule - Web-based instruction: 39 hours

MIPG 4105M - Introduction to Process Control - This course is designed to provide participants with an understanding of the various elements necessary in the design and implementation of process control.

Introduction to Statistical Quality Control; Statistical Methods Useful in Quality Control; Basic Methods of Statistical Process Control; Control Charts for Variables; Control Charts for Attributes; Process and Measurement System Capability Analysis; Acceptance Sampling

Prerequisite - A College / University level Introductory Statistics Course

Schedule - Web-based instruction: 39 hours

MIPG 4106M - Project Management Fundamentals - This is a course in the fundamentals of the profession of Project Management. The objective of this course is to introduce students to the processes and tools involved in initiating, planning, executing, controlling, and closing projects.

Schedule - Web-based instruction: 39 hours
MIPG 4115M – Foodborne Illness and Food Toxicology – This course is designed to enable the student to gain knowledge of the biological and chemical hazards present in foods and their effect on human health. Principles of Food Toxicology, Biotransformations, Chemical Carcinogenesis, Natural Toxins in Animal Foodstuffs, Toxic Photoc hemicals, Environmental Toxins, Animal Drug Residues, Food additives, Toxins formed during Food processing, Important facts of Foodborne Diseases, Foodborne intoxications, Foodborne Infections, Foodborne Toxiniferances, Parasites and Algal Toxins, Food Insensitivities

Schedule - Web-based instruction: 39 hours

MIPG 4116M - Food Hygiene and Food Safety - This course is designed to introduce students to the various aspects of food sanitation and to provide students the necessary tools to design, and implement an effective sanitation program. Sanitation and the Food Industry; Microorganisms; Allergens; Personal Hygiene; Pest and Pest Control; Cleaning and Sanitizing; Food Plant and Equipment Design; Sanitation of Incoming Materials; Water Sanitation; Waste Treatment; Governmental Food Regulations

Schedule - Web-based instruction: 39 hours

Evaluation:
Students in the Post-Graduate Certificate in Food Safety must obtain a passing grade of 65% or better in all program courses. Students who have received a grade less than 65% but 50% or greater in one program course during a single term will be permitted to withdraw from the program. Students who have received a grade less than 65% (but 50% or greater) in more than one program course during a single term will be required to withdraw from the program. Students who have received a grade less than 65% (but 50% or greater) in one program course will be permitted to remain in the program, provided that course is retaken when offered and passed with a grade of 65% or better. Only one such repeat will be permitted per term. Failure to obtain a grade of 65% in the repeated course shall lead to termination of a student's program.

MIPG 4114M - Fundamentals of Canadian Food Laws and Regulations - This course is designed to introduce the major topics in Canadian food laws and regulations that are fundamental in the manufacturing and trade of safe and compliant food commodities. While Canadian food laws and regulations are the primary focus of this course, some international food laws and regulations will also be introduced.

Introduction to Canadian Legal System; Canadian Food Inspection Agency (CFIA); Federal Food Acts and Regulations; Additional Federal Departments and Agencies; Provincial Food Laws and Regulations; International Food Laws and Regulations; Genetically Engineered (GE) Food

Schedule - Web-based instruction: 39 hours
Quality and the Food Industry; Quality Assurance Program; Specifications; Raw Material/Ingredient Supplier Certification; Process Control; Product Quality Audits; Quality Assurance Documentation System; ISO and the Food Industry

**Evaluation:**
Students in the Post-graduate Certificate in Quality Management must obtain a passing grade of 65% or better in all program courses. Students who have received a grade of less than 50% in any course will be required to withdraw from the program. Students who have received a grade less than 65% (but 50% or greater) in more than one program course during a single term will be required to withdraw from the program. Students who have received a grade less than 65% (but 50% or greater) in one program course will be permitted to remain in the program, provided that course is retaken when offered and passed with a grade of 65% or better. Only one such repeat will be permitted per term. Failure to obtain a grade of 65% in the repeated course shall lead to termination of a student’s program.

**Program Entry:**
Please refer to the Admissions Section of this Calendar.

**Program Structure:**
This program is taught by a combination of lectures, practical sessions on finfish and shellfish farms, fieldwork and participation in aquaculture workshops. Faculty expertise is supplemented by guest lecturers from industry, government and aquaculture research institutions.

During the first semester, in addition to statistics, finfish, shellfish culture, practical facility maintenance and animal husbandry and site selection, students also receive training in business-related topics such as marketing and research proposal development. A study tour to local aquaculture sites is also included in the first semester as well as several practical field sessions.

The second semester includes courses in finfish nutrition, fish health, business management, aquaculture & the environment, small vessel operator proficiency, aquaculture engineering and handling and processing aquaculture products. During this semester students also complete an in-depth, industry relevant research project designed to develop skills in experimental design, fish handling and aquaculture systems operations. Students also complete practical aquaculture courses which are designed to develop skills in net making, boating safety, seamanship, and marine emergency duties.

The third semester consists of a 13 - week aquaculture work term. Students work on finfish and shellfish farms or within laboratories and support agencies. Linkages for work terms have been established in Canada, the United States, South America, Australia, and Europe and on international development projects.

**Evaluation:**
Students in Advanced Diplomas must obtain a passing grade of 65% or better in all program courses.

Students who have received a grade of less than 50% in any course will be required to withdraw from the program.

Students who have received a grade less than 65% (but 50% or greater) in more than one program course during a single term will be required to withdraw from the program.

Students who have received a grade less than 65% (but 50% or greater) in one program course will be permitted to remain in the program, provided that course is retaken when offered and passed with a grade of 65% or better. Only one such repeat will be permitted per term. Failure to obtain a grade of 65% in the repeated course shall lead to termination of a student’s program.

**Credit Earned:**
Advanced Diploma in Sustainable Aquaculture

**1 Year:**
2 semesters plus a 3 month work-term placement.

**Normal Start:**
Fall

**Contact:**
Admissions Officer
(709) 778-0380
1-800-563-5799 (ext. 380)
email: admissions@mi.mun.ca

**CAREERS**
Professionals will enhance their careers in the private and public sectors specializing in quality management, project management, quality assurance, and production.
ADVANCED DIPLOMA - SUSTAINABLE AQUACULTURE

**PROGRAM OUTLINE**

**Term 1**  
AQUA 4100 (Aquaculture Seminar Series)  
AQUA 4102 (Shellfish Culture)  
AQUA 4107 (Fish health)  
AQUA 4136 (Aquaculture Engineering)  
AQUA 4155 (Aquaculture Seminar)  
BSMG 4102 (Marketing Aquaculture Products)  
STAT 4103 (Statistics)  
TKPR 411B (Technical Project)  
WKTM 1002 (Work Term Preparation Seminar)  

**Term 2**  
AQUA 4101 (Handling & Processing Aquaculture Products)  
AQUA 4103 (Fish Health)  
AQUA 4104 (Fish Nutrition)  
AQUA 4111 (Aquaculture and the Environment)  
AQUA 4113 (Aquaculture Engineering)  
AQUA 4155 (Aquatic Health)  
BSMG 4104 (Business Management)  
TKPR 411B (Technical Report)  
*AQUA 4114 (Rownork and Wet Mending)  
*STFY 1102 (First Aid)  
*STFY 1125 (Small Vessel Operator Proficiency)  
*STFY 2102 (MED A3)  
* Delivered between Term 2 and 3

**Term 3**  
WKTM 4112 (Work Term - Advanced Diploma in Sustainable Aquaculture)

**PROGRAM HIGHLIGHTS**

This program is designed to graduate students with a variety of strengths that can be used in a large array of employment areas.  
- The development of practical and technical skills is emphasized throughout the program. Students are exposed to operations on nearby aquaculture sites and receive practical training during laboratory and field sessions.  
- Facilities at the Marine Institute have been established in support of a varied teaching and applied research program. A modern aquaculture facility on the main campus consists of a freshwater culture lab, marine culture lab, quarantine / fish health lab, and a live food culture lab.  
- Students also have access to food science laboratories, engineering workshops, net loft, flume tank and a registered food processing plant.  
- Aquaculture faculty and staff maintain close links with the aquaculture industry through advisory work and research activities. Current research activities are focused on fish nutrition, feed development, shellfish culture techniques, and fish and shellfish health.  

A thesis based Masters of Science in Aquaculture Degree is offered by the Marine Institute. Persons wishing to apply for the M.Sc. Program must apply directly to Memorial’s School of Graduate Studies.

**CAREERS**

The goal of the Advanced Diploma in Sustainable Aquaculture program is to prepare students for careers as aquaculture managers, developers and researchers. Graduates of the program have gained employment in a range of aquaculture and related fields. These include fish farm management, work as scientists and aquaculture technologists, aquaculture instructors, and work on aquaculture projects in both the developed and developing world.  
Graduates of this program also find employment in the following areas: fish farm management, aquaculture advisory agencies, federal and provincial government departments, environmental monitoring, fish health suppliers, consulting companies, fish food manufacturers and aquaculture equipment manufacturers and distributors.  
Career opportunities are available in Newfoundland and Labrador, Canada and Internationally.

This program is designed to:  
- provide a strong technical education in the areas of food safety and food inspection  
- prepare students for employment in the food industry and regulatory agencies  
- develop technical and analytical skills in food safety and food inspection

**PROGRAM ENTRY**

Please refer to the Admissions Section of this Calendar.

**PROGRAM STRUCTURE**

The program is divided into the following terms:  
**Term One:**  
Students will be required to take courses in Applied Statistics, Food Microbiology, Food Processing, Food Safety and Sanitation, and Food Chemistry.  
**Term Two:**  
The second term continues the study of food safety and includes such courses as Food Law, Foodborne Diseases, Food Inspection Techniques, Management Principles, and Food Toxicology. A technical project course allows for in depth study of an area of special interest.  
**Term Three:**  
Students will find placements in pertinent industries or agencies for practical experience.

**EVALUATION:**

Students in Advanced Diplomas must obtain a passing grade of 65% or better in all program courses.  
Students who have received a grade of less than 50% in any course will be required to withdraw from the program.  
Students who have received a grade less than 65% (but 50% or greater) in more than one program course during a single term will be required to withdraw from the program.  
Students who have received a grade less than 65% (but 50% or greater) in one program course will be permitted to remain in the program, provided that course is retaken when offered and passed with a grade of 65% or better. Only one such repeat will be permitted per term. Failure to obtain a grade of 65% in the repeated course shall lead to termination of a student’s program.

**CAREERS**

Graduates of this program will find excellent opportunities for challenging and rewarding employment in production, quality assurance, food plant inspection services, food analysis laboratories, regulatory agencies and many other interesting careers.  
**Sample Job Descriptions:**  
- Responsible for the plant sanitation program  
- Quality systems management, H.A.C.C.P., microbiological analysis  
- Supervise all Q.A. functions

ADVANCED DIPLOMA - FOOD SAFETY

**PROGRAM OUTLINE**

**Term 1**  
BIOL 4104 (Food Microbiology)  
CHEM 4102 (Food Chemistry)  
FDTE 4105 (Food Hygiene and Food Safety)  
FDTE 4111 (Food Processing)  
STAT 4106 (Applied Statistics)  
TKPR 413A (Technical Project)  
WKTM 1002 (Work Term Preparation Seminar)  

**Term 2**  
BSMG 4111 (Fundamentals of Canadian Food Laws and Regulations)  
BSMG 4112 (Management Principles)  
*FDTE 2118 (Canned Foods and Thermal Processing)  
FDTE 3102 (Food Safety Enhancement Program/Hazard Analysis Critical Control Point)  
FDTE 3104 (Quality Management Program)  
FDTE 3108 (Global Food Safety Initiatives)  
FDTE 4102 (Food Inspection Techniques)  
FDTE 4104 (Foodborne Diseases - Toxicology)  
*TKPR 413B (Technical Project)  
**Term 3**  
WKTM 4111 (Work Term - Advanced Diploma in Food Safety)  
* Taught 5 consecutive days after end of Semester

**Credit Earned:**  
- Advanced Diploma - Food Safety  
- 1 Year: 2 Semesters and 1 Work Term Session

**Normal Start:** Fall

**Contact:**  
- Admissions Officer  
  (709) 778-0380  
  1-800-563-5799 (ext. 380)  
  email: admissions@mi.mun.ca

**PROGRAM HIGHLIGHTS**

This program emphasizes the food quality/assurance component of the industry together with food safety.  
Students will experience a range of teaching methods including lectures, tutorials, laboratories, seminars and study tours.

**CAREERS**

Graduates of this program will find excellent opportunities for challenging and rewarding employment in production, quality assurance, food plant inspection services, food analysis laboratories, regulatory agencies and many other interesting careers.  
**Sample Job Descriptions:**  
- Responsible for the plant sanitation program  
- Quality systems management, H.A.C.C.P., microbiological analysis  
- Supervise all Q.A. functions
**ADVANCED DIPLOMA - WATER QUALITY**

**PROGRAM ENTRY**
Please refer to the Admissions Section of this Calendar.

**PROGRAM STRUCTURE**

The program is comprised of two thirteen (13) week academic terms, a six (6) week technical session and a thirteen (13) week work term. The academic semester and technical session consist of a balance of theory and practical applications through lectures, discussion seminars, case studies, laboratory, field trips and an independent research project. The work term will involve students placed in pertinent industries or agencies for practical work experience.

**EVALUATION:**

Students in Advanced Diplomas must obtain a passing grade of 65% or better in all program courses. Students who have received a grade of less than 50% in any course will be required to withdraw from the program. Students who have received a grade less than 65% (but 50% or greater) in more than one program course during a single term will be required to withdraw from the program.

Students who have received a grade less than 65% (but 50% or greater) in one program course will be permitted to remain in the program, provided that course is retaken when offered and passed with a grade of 65% or better. Only one such repeat will be permitted per term. Failure to obtain a grade of 65% in the repeated course shall lead to termination of a student’s program.

**CAREERS**

While the program is designed to focus the students’ academic and technical competencies specific to the water quality field, their undergraduate degree discipline often directs and influences their career choice. Graduates find employment in water and wastewater utilities, environmental companies, engineering and laboratory companies, oil/gas mining sectors, regulatory agencies and NGOs. In addition, graduates have been successful in securing careers in the beverage, food and manufacturing industries that utilize water.

**PROGRAM OUTLINE**

<table>
<thead>
<tr>
<th>Term 1</th>
<th>BIOL 4105 (Water and Wastewater Microbiological Analysis) CHEM 4101 (Water Chemistry) FDE 4110 (Introduction to Water and Wastewater Treatment) GEOG 4103 (Aquatic Systems) GEOG 4220 (Geographic Information Systems) STAT 4103 (Statistics - Water Quality) TKPR 415A (Technical Project) WKTM 1002 (Work Term Preparation Seminar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 2</td>
<td>BIOL 4200 (Water and Wastewater Microbiology) BSMG 4110 (Environmental Policy - Water Quality) CHEM 4200 (Chemical and Analytical Methods) FDE 4203 (Water and Wastewater Processing I) GEOG 4101 (Remote Sensing) TKPR 415B (Technical Project)</td>
</tr>
<tr>
<td>Technical Session</td>
<td>SFTY 1125 (Small Vessel Operator Proficiency) SFTY 1135 (Practical Boat Handling Skills) SFTY 2102 (MEQ A3) FDE 4204 (Water and Wastewater Processing II) GEOG 4301 (Applied GIS and Remote Sensing for Water Quality) TKPR 415C (Technical Project)</td>
</tr>
<tr>
<td>Term 3 (Work Term)</td>
<td>WKTM 4110 (Work Term - Advanced Diploma in Water Quality)</td>
</tr>
</tbody>
</table>

**NOTE:**

TKPR 415A/B/C must be completed sequentially in the same academic year.

**Credit Earned:**

Advanced Diploma - Water Quality

**Normal Start:**

Fall

**Contact:**

Admissions Officer

(709) 778 - 0380

1-800-563-5799 (ext. 380)

email: admissions@mnl.mun.ca

**PROGRAM HIGHLIGHTS**

The Marine Institute’s Advanced Diploma in Water Quality is the only post-graduate program of its kind in Atlantic Canada that focuses on the study of water and wastewater. Many areas throughout the world are facing a crisis over the supply and quality of water, water for drinking, agriculture, aquatic ecosystems, industrial and manufacturing purposes. Students are provided with significant training in the technical aspects of water and wastewater treatment. Students also complete specific courses in microbiology, chemistry, limnology, water and environmental policy, statistics and geographic information systems (GIS) and remote sensing that enhance their understanding of the science behind water and wastewater treatment and management. Another unique aspect of the program is it provides students with an introduction to the socio-economic, environmental, and legislative policies, regulations and the importance of protecting and managing water resources.

**MISSION**

This program is designed to provide a strong technical education in engineering technology, by developing analytical and synthesis skills, complemented by practical training.

**PROGRAM OVERVIEW**

**Main Areas of Study:**

- Marine Engineering Knowledge
- Electrotechnology
- Naval Architecture
- Thermodynamics
- Strength of Materials
- Welding and Machining

**Accreditation Status:**

Transport Canada

**PROGRAM ENTRY**

Please refer to the Admissions section of this Calendar

**DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING TECHNOLOGY**

**PROGRAM OUTLINE**

**Term 1**

- BSMG 4110 (Environmental Policy - Water Quality)
- CHEM 4200 (Chemical and Analytical Methods)
- FDTE 4110 (Introduction to Water and Wastewater Treatment)
- GEOG 4103 (Aquatic Systems)
- GEOG 4220 (Geographic Information Systems)
- STAT 4103 (Statistics - Water Quality)
- TKPR 415A (Technical Project)
- WKTM 1002 (Work Term Preparation Seminar)

**Term 2**

- BIOL 4200 (Water and Wastewater Microbiology)
- BSMG 4110 (Environmental Policy - Water Quality)
- CHEM 4200 (Chemical and Analytical Methods)
- FDTE 4203 (Water and Wastewater Processing I)
- GEOG 4101 (Remote Sensing)
- TKPR 415B (Technical Project)

**Technical Session**

- SFTY 1125 (Small Vessel Operator Proficiency)
- SFTY 1135 (Practical Boat Handling Skills)
- SFTY 2102 (MEQ A3)
- FDE 4204 (Water and Wastewater Processing II)
- GEOG 4301 (Applied GIS and Remote Sensing for Water Quality)
- TKPR 415C (Technical Project)

**Term 3 (Work Term)**

- WKTM 4110 (Work Term - Advanced Diploma in Water Quality)

**NOTE:**

TKPR 415A/B/C must be completed sequentially in the same academic year.

**Credit Earned:**

Diploma of Technology

**4 years:**

- 7 academic terms, 2 Technical Sessions and 3 Work Terms

**Normal Start:**

Fall

**School of Maritime Studies**

**Contact:**

Admissions Officer

(709) 778 - 0380

1-800-563-5799 (ext. 380)

email: admissions@mnl.mun.ca

**PROGRAM HIGHLIGHTS**

This program is designed to graduate students with a variety of strengths that can be used in a large array of employment areas.

- Discipline-related and application courses are supplemented by further courses in Mathematics, to support the technical content; by Marine Law and courses in Business Management.
- The program recognizes the increasing role and use of computers in the technologies. Computer application and familiarity with common engineering software is stressed wherever possible. Students have CAD courses designed to give extensive exposure to packages such as advanced AutoCAD, which is required in the job market. These packages keep students current with industry standards and improve employment prospects.
- The program is recognized and accredited by Transport Canada for remission of sea time and non-safety credited examinations at levels from Fourth Class to Second Class certificates of competency. The graduates from the Marine Engineering program may choose from shore-based marine employment or ship-based employment as engineering officers.
- Upon graduation the student can be credited with 30-months sea service. To qualify to write the initial certificate of competency (4th Class) the graduate must submit to Transport Canada a Sea Training Manual together with proof of graduation and six months active sea service.
- The graduates are exempted from the following challenge examinations in Third and Second Class certificates: Naval Architecture, Electrotechnology, Thermodynamics and Applied Mathematics.
- In addition to the certification opportunities described, graduates of the Marine Institute Diploma of Technology in Marine Engineering are eligible for admission to the Memorial University Bachelor of Maritime Studies or Bachelor of Technology programs. Upon completion of the diploma, candidates are required to complete 13 additional courses for the Bachelor degree...

**PROGRAM STRUCTURE**

**Length of the Program:**

- 4 Years

**Number of Semesters:**

- 7 Academic Terms

**Number of Courses:**

- 62 courses, including all required safety courses

**Work Terms:**

- 3 Work terms (total of 183 days minimum)

**EVALUATION:**

The minimum passing grade for all courses in the Marine Engineering Technology program is 65%. A cumulative average of 60% must also be maintained throughout the course of the program.

email:

1-800-563-5799 (ext. 380)

programoutlines@mi.mun.ca

admissions@mi.mun.ca
PHYSICAL REQUIREMENTS

Applicants seeking entry to the Marine Engineering Technology program, which leads to Transport Canada Certification, should note that Transport Canada requires proof of satisfactory physical fitness prior to sitting for any Transport Canada exams. This includes satisfactory visual acuity, colour vision, and hearing among other physical requirements.

Proof of physical fitness is also required for students to participate in Marine Emergency Duties (MED) Training which is a compulsory part of these programs.

Proof of physical fitness must be provided by way of a signed medical from an approved physician. Transport Canada Seafarers medical is required for admission to each respective program. The list of physicians approved to conduct either the Seafarer’s or MED medical is available from the Marine Institute Office of the Registrar. Details of the physical requirements for the Seafarer’s Medical may be obtained from Transport Canada at the following address:

Marine Safety Directorate
John Cabot Building
10 Barter’s Hill, P.O. Box 1300
St. John’s, NL A1C 6H8
(709) 772 - 5167
or online at: www.tc.gc.ca.

CAREERS

The goal of the Marine Engineering Technology program is to prepare students for careers in engineering without limiting their options. Besides the traditional marine engineering positions, students find employment with government agencies, consulting engineering companies, and industrial production companies. Some students find employment with refineries and offshore-related industries.

The program provides graduates not only for the local market, but also for the national and international market. With the variety of courses offered in the program, graduating students have exposure to most of the common areas of engineering.

Most graduating technologists from this program will work initially under the supervision of a licensed marine engineer, but will, as their careers advance, work independently. Many graduates have advanced to senior supervisory positions, and some are partners in engineering enterprises.

Sample Job Description - Shore Based

- Responsible for the commission and inspection of new equipment and for preparation of commissioning and inspection reports.
- Marine surveyors for Transport Canada and other inspection, insurance and classification agencies.
- Work as engine fitters, supervisors, and managers in shipyards.
- Positions and duties relating to power engineering can also be filled by marine engineering graduates. The certification system controlled by the provincial Department of Labour can also be attempted with sufficient boiler room operational experience.
- Involved in the design and layout of a vessel’s machinery space and responsible for the installation of the equipment in new ship construction.
- Supervise the fitting out and refit of drydocked vessels.
- Represents a company’s interests in the construction, fitting out and acceptance of new vessels.

Sample Job Description - Ship Based

- Fullfill technical to administrative duties from junior rank to that of the chief engineers position on ships of all power ratings (Steam/Motor).
- Responsible in developing annual vessel refit lists and supervising its completion.
- Responsible for facility, personnel and energy management.
- Identifies operational and design problem areas and implements solutions.
- A chief engineer represents shore-based management.

PROGRAM OUTLINE

DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING TECHNOLOGY

**Taught after completion of other courses in the Term

**Technical Session 2

ELTK 2303 (Electro-Maintenance)
NARC 2318 (Shipbuilding - Mechanical)
SFTY 1123 (Oil and Chemical Tanker Familiarization)
SFTY 1124 (Confined Space Entry Awareness) - To be delivered after SFTY 1123
SFTY 1129 (Security Awareness for Seafarers with DSD)
WKPR 2217 (Machine Shop III)

Work Term 1

WKTM 1103 (Work Term I - Marine Engineering Technology)

Term 5

ELTK 3203 (Rotating AC Machines)
ELTR 3123 (Electronic Devices & Digital Systems)
MREK 3107 (Marine Engineering Knowledge V)
MTPR 3104 (Strength of Materials)
NARC 3110 (Rudders and Propulsion)
TMRO 3107 (Thermodynamics)
WKPR 3206 (Welding Shop III)

Work Term 2

WKTM 2103 (Work Term II - Marine Engineering Technology)

Term 6

CHEM 3201 (Industrial Chemistry)
CNTL 3205 (Marine Process Measurements an )
ELTK 3204 (DC Machines and Transformers)
MREK 3206 (Marine Engineering Knowledge VI)
**SFTY 1117 (Survival Craft - STCW ‘95 V12)

Work Term 3

WKTM 3103 (Work Term III - Marine Engineering Technology)

Term 7

BSMG 3400 (Leadership and Teamwork)
BSMG 3401 (Mar. Law and Environmental Stewardship)
CNTL 3401 (Instrumentation, Controls & Automation)
ELTK 3400 (Shipboard Voltage Distribution Systems)
MREK 3400 (Marine Engineering Knowledge VII)
MREK 3401 (Propulsion Plant Simulator)
NARC XXXX (Naval Architecture)
SFTY 1118 (Advanced Firefighting - STCW ’95 VI3 & Officer Certification)

**Term 8

WKTM 4103 (Work Term IV - Marine Engineering Technology)

Term 9

ETEC 3401 (Ship Dynamics/Power Engineering)
BSMG 3402 (Marine Law and Environmental Stewardship)
BSMG 3403 (Leadership and Teamwork)
NARC XXXX (Naval Architecture)
SFTY 1118 (Advanced Firefighting - STCW ’95 VI3 & Officer Certification)

**Term 10

WKTM 5103 (Work Term V - Marine Engineering Technology)

Term 11

**Technical Session 1

ELTK 1102 (Electro-Technology)
ENGR 1102 (Engineering Drawing)
FLOD 2105 (Fluid Mechanics)
MATH 1105 (Introduction to Calculus)
MREK 1201 (Marine Engineering Knowledge I)
WKPR 1110 (Welding Shop I)

Technical Session I

ENGR 1104 (Engineering Graphics)
MTPR 1300 (Materials & Processes)
SFTY 1106 (Marine Advanced First Aid)
SFTY 1114 (BASIC SAFETY - STCW ’95 VII)
WKPR 1109 (Welding Shop I)

Term 3

ELTK 2119 (Marine Electrical Systems)
FLOD 3105 (Hydraulics & Pneumatics)
MATH 1201 (Calculus)
MECH 2111 (Statics and Dynamics)
MREK 2111 (Marine Engineering Knowledge III)
TMRO 2106 (Thermodynamics)
WKPR 1117 (Machine Shop I)

Term 4

BSMG 3113 (Personal Resource Management)
MECH 2207 (Theory of Machines)
MREK 2209 (Marine Engineering Knowledge IV)
MTPR 2108 (Strength of Materials)
NARC 2228 (Shipbuilding)
TMRO 2204 (Thermodynamics)
WKPR 2113 (Welding Shop II)
WKPR 2117 (Machine Shop II)

PROGRAM OUTLINE

Term 1

CMSK 1105 (Technical Communications I)
ELTK 1102 (Electro-Technology)
ENGR 1105 (Engineering Graphics)
MATH 1100 (Pre-Calculus)
MREK 1101 (Marine Engineering Knowledge I)
PHYS 1103 (Physics)
SFTY 1104 (WHMIS)
WKPR 1110 (Welding Shop I)

Term 2

CMSK 1205 (Technical Communications II)
ELTK 1202 (Electro-Technology)
ENGR 1102 (Engineering Drawing)
FLOD 2105 (Fluid Mechanics)
MATH 1105 (Introduction to Calculus)
MREK 1201 (Marine Engineering Knowledge II)
WKPR 1200 (Welding Shop)

Technical Session I

ENGR 1104 (Engineering Graphics)
MTPR 1300 (Materials & Processes)
SFTY 1106 (Marine Advanced First Aid)
SFTY 1114 (BASIC SAFETY - STCW ’95 VII)
WKPR 1109 (Welding Shop I)

Term 3

ELTK 2119 (Marine Electrical Systems)
FLOD 3105 (Hydraulics & Pneumatics)
MATH 1201 (Calculus)
MECH 2111 (Statics and Dynamics)
MREK 2111 (Marine Engineering Knowledge III)
TMRO 2106 (Thermodynamics)
WKPR 1117 (Machine Shop I)

Term 4

BSMG 3113 (Personal Resource Management)
MECH 2207 (Theory of Machines)
MREK 2209 (Marine Engineering Knowledge IV)
MTPR 2108 (Strength of Materials)
NARC 2228 (Shipbuilding)
TMRO 2204 (Thermodynamics)
WKPR 2113 (Welding Shop II)
WKPR 2117 (Machine Shop II)

DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING TECHNOLOGY
followed by an 8 week work term placement with skills training session after Term 4 is five weeks in duration and is for human interaction with the environment. The second practical and marine resource use. This year serves to give a solid foundation. In the second year students focus on environmental issues relating to scientific and social problems of marine pollution and marine resource use. This year serves to give a solid background in environmental science and technology and the use of environmental legislation and policy as a control measure for human interaction with the environment. The second practical skills training session after Term 4 is five weeks in duration and is followed by an 8 week work term placement with industry or environmental agencies. Following Term 4 students are academically and practically prepared for their work term placement and have completed the certification requirements for Standard First Aid, TDG, WHMIS, MED-A1, , SVOP (Small Vessels Operators Proficiency), Basic Oil Spill Responder, Confined Space Awareness and H2S Alive. Additionally, the students have a strong background in communications, computer skills and laboratory skills. The work term placement will provide an opportunity for students to apply the skills and knowledge obtained from the first two years of the program. The final year continues to build on the environmental concepts especially those related to environmental management. During this year students will undertake a major technical research project with the support of a team of supervisors from faculty and support staff. Following the sixth semester a four week professional orientation places the student with industry to gain further professional experience prior to the June graduation.

PROGRAM HIGHLIGHTS

The program is designed to equip graduates with the ability to work in the relatively new and expanding area of Marine Environmental Technology. The environmental sector in general is growing at a fast rate and in light of recent problems in the fisheries and the crowding of our coastal areas, there is a need for resource management technologists who can apply technical expertise in the ocean and coastal environments. Some of the highlights of the program are given below.

- Upon graduation, students will be familiar with the underlying scientific principles of environmental operations as well as the policy and legal framework that forms current environmental regulations. They will be exposed to the multidisciplinary aspect of the environmental sector.
- To meet the needs of industry, discipline-related courses are supplemented by further training in the areas of computer applications, communications, business principles and economics.
- The program recognizes the increasing role of computers in the environmental sector. Computer basics are taught early in the program allowing advanced courses to take advantage of computer related topics such as remote sensing and geographic information systems.
- In order to give participants in the program experience in the industry, a mandatory work term is included in the program. This eight week session allows the student to gain experience in an industry setting.
- In addition to the certification opportunities described, graduates of the Marine Institute Diploma of Technology in Marine Environmental Technology are eligible for admission to the Memorial University Bachelor of Technology program. Candidates are required to complete 13 courses for the Bachelor of Technology degree.
- Certified training will be provided in Standard First Aid, TDG, WHMIS, MED-A1, MED-A3, SVOP (Small Vessel Operators Proficiency), Basic Oil Spill Responder, Confined Space Awareness and H2S Alive.
- Students will be familiar with sampling methodologies for scientific study in air, water and biological sampling.
- The professional orientation session prior to graduation provides students additional work experience and industry contacts.

CAREERS

The goal of the Marine Environmental Technology Program is to develop environmental technologists who possess the knowledge and skills to work in the marine area. However, graduates are not limited to working in marine sectors as the program includes broad environmental principles applicable to diverse sectors. Skill development in sampling methodologies apply to freshwater and terrestrial areas. Program graduates have been successful in applying their skills and knowledge to environmental sectors that are both marine and land based.

Through extensive consultation with industry, skills that employers find useful have been identified and are focused on through the program. Since many of the companies operating in the environmental sector are relatively small and consultancy based, communication and business skills are integrated into the program. The result is a graduate who can fill a number of different roles in the environmental sector.

Sample job descriptions include:

- Field technologist who collects samples in a potentially polluted area. With experience, the technologist will be able to manage a field operation.
- Environmental advisor on the use, conservation and protection of coastal areas.
- Apply local laws, rules and regulations in the development of safe environmental plans, assessments, etc.
- Perform laboratory analysis on chemical and biological samples.
- Respond to chemical spills and assist with cleanup operations. With experience, students should be able to oversee cleanup operations.

Possible Job Titles are:

- Fishery Observer
- Environmental Technologist
- Environmental Officer
- Fishery Officer
- Pollution Abatement Officer
- Laboratory Technologist
- Operator of Environmental Facility
- Assessment Officer
- Technical Salesperson
- Pollution Control Officer

Contact:

School of Fisheries
Admissions Officer
(709) 778-0380
1-800-563-5799 (ext. 380)
email: admissions@mi.mun.ca
DIPLOMA OF TECHNOLOGY - MARINE ENVIRONMENTAL TECHNOLOGY

PROGRAM OUTLINE

Term 1
BIOL 1100 (Biology)
CHEM 1101 (General Chemistry I)
CMSK 1102 (Technical Communications)
One of: MATH 1100 (Pre-Calculus) or MATH 1101 (Introduction to Calculus)
MENV XXXX (Marine Environment)
PHYS 1100 (Physics)
SFTY 1104 (Workplace Hazardous Materials Information System)

Term 2
CHEM 1201 (General Chemistry II)
CMSK 1201 (Communication at Work)
CPSK 1103 (Computer Database and Spreadsheet Applications)
One of: MATH 1101 (Introduction to Calculus) or MATH 1200 (Calculus)
ONGR 2103 (Oceanoigraphy)
PHYS 1200 (Physics)

Technical Session (Practical Skills)
MENV 1100 (Sampling I)
MENV 1101 (Industry Visit)
MENV 2103 (Basic Oil Spill Responder)
SFTY 1108 (MED A1)
SFTY 1124 (Confined Space Entry Awareness)
SFTY 1125 (Small Vessel Operator Proficiency)
SFTY 1130 (Intro. to Transportation of Dangerous Goods (TDG))
SFTY 2100 (Small Craft Safety & Boat Handling)

Term 3
BIOL 2100 (Microbiology)
BSMG 2104 (Policy and Law)
CHEM 2202 (Environmental Chemistry I)
CMSK 2101 (Technical Communications)
MATH 1200 (Calculus)
SFTY 2101 (H2S Alive)
WKTM 1002 (Work Term Preparation Seminar)

Term 4
CHEM 2103 (Organic Chemistry)
CMSK 2201 (Technical Communications)
GEOG 2100 (Geography)
MENV 2101 (Dynamics of Marine Pollution)
MENV 2300 (Environmental Applications of Industrial Hygiene)
SFTY 2201 (Boating - Practical Skills)
STAT 2108 (Applied Statistics)

Technical Session 2 (Practical Skills)
BIOL 2300 (Fish Identification and Remediation)
MENV 2102 (Marine Sampling)
MENV 2302 (Environmental Microbiology Field Studies)
SFTY 2300 (Small Boat Navigation for Marine Sampling)

Work Term
WKTM 2106 (Work Term)

Term 5
BIOL 3100 (Marine Biology)
BSMG 3121 (Environmental Economics & Project Management)
CHEM 2300 (Environmental Chemistry II)
GEOG 2102 (Mapping and GIS)
MENV 2301 (Fisheries Conservation Technologies)
TKPR 312A (Technological Thesis)

Term 6
BIOL 2100 (Aquatic Ecology)
BSMG 3111 (Environmental Assessment and Auditing)
BSMG 3119 (Management Principles)
GEOG 2200 (Remote Sensing)
MENV 3102 (Fundamentals of Coastal Zone Management)
TKPR 312B (Technological Thesis)

Work Term
WKTM 3300 (Professional Orientation)

MISSION

The Marine Engineering Systems Design program is designed to:
• provide a strong technical education in marine piping, machinery & propulsion systems design supported by a good knowledge of marine engineering and naval architecture
• provide a good technical education in general mechanical engineering technology
• prepare students for employment in marine, offshore and land based environments
• develop analytical and synthesis skills complemented by practical training.

PROGRAM OVERVIEW

Information on the Discipline:
Marine Engineering Systems Design is a relatively unique program developed in the early 80’s to bridge the gap between Naval Architecture and Marine Engineering. Students receive instruction in aspects of both disciplines and will work closely with Marine Engineers and Naval Architects throughout their careers.

Main Areas of Study:
The main areas of study in the program are auxiliary systems, power/propulsion systems, electrotechnology, fluid mechanics and thermodynamics.

Characteristics of Graduates:
Successful graduates of the Marine Engineering Systems Design program have a strong work ethic and a respectable understanding of marine engineering systems.

PROGRAM ENTRY

Please refer to the Admissions section of this Calendar.

PROGRAM STRUCTURE

Length of the Program:
Students will require three years to complete the diploma.

Number of Semesters:
The program consists of six (6) 13 week academic terms and three (3) 5 week technical terms.

Number of Courses:
The program is comprised of a total of 49 courses.

Work Terms:
There are no work terms in the program however many students obtain summer employment within the field. A number of local and national companies regularly hire students for summer positions after their second year.

Topics Covered in each Semester:
In the early semesters, each semester is comprised of both academic and technical courses. As students progress through the program, technical courses become the main focus.

DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING SYSTEMS DESIGN

PROGRAM HIGHLIGHTS

This program is designed to graduate students with a variety of strengths that can be used in a large array of employment areas:
• Discipline-related and application/design courses are supplemented by further courses in Mathematics, to support the technical content and courses in Engineering Design and Economics.
• Computer application and familiarity with common engineering software is stressed wherever possible. Students complete courses designed to give extensive exposure to industry relevant software such as AutoCAD, MS Excel, MS Word, MS Powerpoint and more. These and other software packages ensure students become current with industry standards and improve employment prospects.
• Marine Engineering Systems Design requires considerable use of multiple computer applications and as such, the program has been designated a laptop program. Students receive a state of the art laptop computer preloaded with all required software at the start of their second year and use it throughout the rest of their studies. After successful completion of the program, graduates may elect to purchase the laptop for a modest fee.
• Courses in Engineering Economics, Shipyard Management and Engineering Management are included in the Marine Engineering Systems Design technology program to introduce students to the requirements for running or managing a business. The courses provide background in the financial aspects and methods of project planning and management decision making.
• In addition graduates of the Marine Institute Diploma of Technology in Marine Engineering Systems Design are eligible for admission to the Memorial University Bachelor of Maritime Studies and Bachelor of Technology Programs. Upon completion of the diploma, candidates are required to complete 13 additional courses for the Bachelor of Maritime Studies degree or Bachelor of Technology degree.
**PROGRAM OUTLINE**

**Term 1**
- CHEM 1100 (Chemistry)
- CMSK 1102 (Technical Communications I)
- ENGR 1103 (Engineering Graphics)
- ENSY 1101 (Prime Movers & Auxiliary Power Plants)
- ENSY 1202 (Introduction to Marine Engineering Systems Design)
  
  One of:  
  - MATH 1100 (Pre-Calculus)
  - or
  - MATH 1101 (Introduction to Calculus)

  PHYS 1100 (Physics)
  SFTY 1104 (WHMIS)

**Term 2**
- ENGR 1201 (Introduction to AutoCAD)
- FLDS 2100 (Fluid Mechanics)
  
  One of:  
  - MATH 1100 (Pre-Calculus)
  - or
  - MATH 1101 (Introduction to Calculus)
  - or
  - MATH 1200 (Calculus)

  MECH 2102 (Mechanics)
  MTPR 2104 (Materials and Processes)
  NARC 1102 (Ship Structural Geometry)
  PHYS 1200 (Physics)

**Technical Session I**
- CMSK 1201 (Communication at Work)
- ENSY 2000 (Ship Engineering Design Process)
- WKPR 2119 (Workshop Practice)

**Term 3**
- ELTK 1100 (Electrotechnology)
- ENSY 2103 (Power and Resistance Technology)
- ENSY 2200 (Auxiliary Systems)
- MATH 1200 (Calculus)
- MTPR 2100 (Strength of Materials)
- TRMO 2100 (Thermodynamics)

**Term 4**
- ELTK 1200 (Electrotechnology)
- ENSY 2102 (Propulsion Technology)
- ENSY 2201 (Auxiliary Systems)
- MATH 2101 (Advanced Calculus)
- MTPR 3100 (Strength of Materials)
- TRMO 2200 (Thermodynamics)

**Technical Session 2**
- ENSY 2202 (Ship’s Space Ventilation)
- ENSY 3000 (Cold Environment Design)
- TRMO 3101 (Applied Thermodynamics - Refrigeration & Air Conditioning)

**Term 5**
- ENSY 3102 (Propulsion Arrangement Design)
- ENSY 3300 (Ship Engineering Project)
- ENSY 3103 (Ship Stability for MESD)
- FLDS 2201 (Marine Hydraulics)
- TRMO 3103 (Thermodynamics)

**Term 6**
- BSMG 3101 (Engineering Economics)
- CNTL 2302 (Instrumentation, Controls & Automation)
- ENSY 3104 (Applied Marine Engineering Design)
- ENSY 3301 (Ship Engineering Project)
- ENSY 3302 (Marine Electrical Project)
- ENSY 3303 (Auxiliary Machinery Arrangement)
- ENSY 3304 (Piping Arrangement Design)

**Technical Session 3**
- BSMG 3105 (Shipyard Management)
- ENSY 3305 (Project Presentation)
- NARC 3209 (Offshore Structures)

**PHYSICAL REQUIREMENTS**

**NOT Applicable**

**CAREERS**

The goal of the Marine Engineering Systems Design technology program is to prepare students for careers particularly in ship building/ship repairing and offshore industries, but also in general mechanical engineering without limiting their options. In addition to shipyard positions, students find employment with government agencies, consulting engineering companies, offshore and ocean engineering companies, engineering sales and servicing companies, utility and industrial production companies. Some students find employment with the Canadian Navy, refineries and pipelines industry.

This program permits many versatile and diverse job opportunities. Most graduating technologists from this program will work initially under the supervision of a professional engineer or technologists, but will, as their careers advance, work independently. Many graduates have advanced to senior positions, and some are partners in engineering enterprises.

**Evaluation:**
- Evaluation (where applicable)

**Graduation Requirements**
- Cumulative average of 60%

**Sample Job Description**
- See sample job description below

**Location**
- The program provides graduates not only for the local market, but also for the national and international market. With the variety of courses offered in the program, graduating students have exposure to most of the common areas of mechanical and marine engineering.

**Sample Job Descriptions:**

**Marine Systems Designer**
- Working under supervision of an engineer, assists in the design and implementation of piping and pumping systems, spaces ventilation, power plant systems, propulsion systems, domestic systems and cargo handling systems.
- Preparing complicated drawings and graphic images, using traditional and computerized (CAD) methods.
- Prepares inspection reports and the field data.

**Repair Estimator**
- Working under supervision of an engineer, assists in field data requisition, work scope estimation and analysis.
- Prepares drawings and sketches by hand or in CAD.
- Prepares material requisitions and work schedules.

**Quality Assurance Technologists**
- Working under supervision of an engineer, assists in the development of a quality assurance manual for pipe spools fabrication and testing.
- Maintains quality control process on the manufacture of pipe systems.
- Identifies production problems and implements solutions.
- Prepares inspection reports and develops required inspection forms.

**Ship Propulsion Designer**
- Will work under supervision of an engineer and may have supervision over draughts persons.
- Prepares assembly drawings using CAD and performs classification calculations.
- Maintains technical liaison with clients, classification societies and contractors.
- Assists in surveys and prepares reports.
The Diploma of Technology in Nautical Science is a globally recognized, co-operative program which is accredited by Transport Canada in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 2010 (Manila Convention). This cadet program is designed to:
- provide a strong theoretical and practical education in the field of nautical science;
- prepare students for employment in marine transportation;
- produce graduates who are capable of accepting the responsibilities and performing the duties assigned to them as ship’s officers;
- prepare students for professional recognition as seafaring officers by Transport Canada and to sit for the remaining Transport Canada examinations for the Watchkeeping Mate Certificate of Competence.

**PROGRAM ENTRY**

Please refer to the Admissions section of this Calendar.

**PHYSICAL REQUIREMENTS**

Applicants seeking entry to Marine Institute programs which lead to Transport Canada Certification for Seafarers’s should note that Transport Canada requires proof of satisfactory physical fitness prior to sitting for any Transport Canada exams. This includes satisfactory visual acuity, colour vision, and hearing among other physical requirements.

These programs include the Marine Institute Diplomas of Technology in Nautical Science, Marine Engineering, the Vocational Certificate in Marine Diesel Mechanics and the Technical Certificate in Bridge Watchkeeping Program. Proof of physical fitness is also required for students to participate in Marine Emergency Duties (MED) Training which is a compulsory part of these programs.

Proof of physical fitness must be provided by way of a signed medical from an approved physician. Signed Seafarer’s medicals from an approved physician are required for admission to each respective program. The list of physicians approved to conduct the Seafarer’s medical is available from the Marine Institute Office of the Registrar. Details of the physical requirements for the Seafarer’s Medical may be obtained from Transport Canada at the following address:

**Marine Safety Directorate**

John Cabot Building, 10 Barter’s Hill
P.O. Box 1300, St. John’s, NL A1C 6H8
(709) 772 - 5167

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Program Structure</strong></td>
<td>As a co-operative program, the Nautical Science diploma consists of periods of study at the Marine Institute which alternate with periods at sea. The program consists of:</td>
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<tr>
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<td>• First Year consists of semester one and two followed by an eight-week technical session and:</td>
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<td>• a two-month sea phase following the first technical session;</td>
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<td></td>
<td>• a second or intermediate year of study consisting of semesters three and four, followed by an eight-week technical session;</td>
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<td>• a fifteen-month sea phase following the second technical session. This sea phase may be completed over two work term periods; and,</td>
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<td>• a third or advanced year of study consisting of semesters five and six followed by a final eight-week technical session.</td>
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<td>The total time to complete the program is normally four years. As indicated, the first year of study, commencing in September, consists of two terms (fall and winter). Here the focus is on math, the sciences, and communications. Students are introduced to ships and shipping in their first and second term which is followed by an eight-week Technical Session. The Technical Session is completed in the spring following Term 2. The focus in technical session is on hands on courses and on short courses in Marine Emergency Duties.</td>
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<tr>
<td></td>
<td>The first Technical Session therefore serves the twin purposes of further introducing the cadet to the technical content of the program while carrying out practical exercises at sea and taking a series of short courses in Marine Emergency Duties (MED). The MED training prepares the students for the realities of emergencies at sea and the part that they might play in them. This, in combination with the practical exercises at sea, provides for safer sea phases for the cadets.</td>
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<td></td>
<td>The second year focuses entirely on such technical subjects as navigation systems, stability, and seamanship. The second technical session serves the same purpose and its made up of technical courses which not only contribute to the overall technical competence of the cadets but provides them with other skills which employers consider essential. The student who has successfully completed all of the primary and intermediate parts of the program may be eligible to sit for the Transport Canada’s Bridge Watch Rating Examination.</td>
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<td></td>
<td>The final year of study covers advanced materials in courses introduced previously. Other subjects involving the business and management of shipping are also introduced here. The final Technical Session again involves technical materials including the practice of bridge resource management which, in part, is carried out on the Institute’s full mission bridge simulator.</td>
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<tr>
<td><strong>Sea Phases</strong></td>
<td>During the program, the cadet must accumulate a minimum of 12 months of recognized sea time in sea placements which have been approved by the Institute through The Office of Career Integrated learning. This is acquired through compulsory sea phase periods which are governed by the Marine Institute General Work Term Guidelines and the Nautical Science Work Term Regulations. These sea phases are, in fact, guided work terms for which accredited logbooks must be kept and the employers carry out personal evaluations of the cadets.</td>
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<td>The first sea phase (WKTM 2102) is scheduled over a two-month period between the end of the first technical session and the beginning of the following semester.</td>
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<td>Following the second Technical Session, the student commences the second sea phase (WKTM 2102). This is an extended period of 15 months wherein the student must accumulate the remainder of the required 12 months sea time.</td>
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<table>
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<tr>
<th>Credit Earned</th>
<th>Diploma of Technology</th>
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<tbody>
<tr>
<td>4 years:</td>
<td>(6 Academic Terms, 3 Technical Sessions and 2 Sea Phase Work Terms)</td>
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<tr>
<td>Normal Start:</td>
<td>Fall</td>
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<tr>
<td>School of Maritime Studies</td>
<td></td>
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<tr>
<td>Contact:</td>
<td>Admissions Officer</td>
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<tr>
<td></td>
<td>(709) 778-0380</td>
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<td>1-800-563-5799 (ext. 380)</td>
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<tr>
<td>e-mail:</td>
<td><a href="mailto:admissions@mi.mun.ca">admissions@mi.mun.ca</a></td>
</tr>
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</table>

**Transport Canada Certification**

- Subject to the Marine Institute general academic regulations governing graduation, graduates of the Diploma of Technology in Nautical Science having a cumulative average of 70% and an attendance rate of at least 90% in the program are eligible for exemptions from Transport Canada for specific examinations.

- Transport Canada recognizes the benefits of education and training in marine transportation. The reality is that these benefits translate into a remission of sea service from Transport Canada for the time spent in school at the Marine Institute. In this case it is a full 24 months. Normally, seafarers applying to Transport Canada to sit for Watchkeeping Mate Certificate examinations would be required to have accumulated 36 months sea time. However, Marine Institute graduates are required to accumulate only 12 months for the same certificate.

- Consequently, eligible diploma graduates may apply to sit for their Transport Canada examinations in Navigation Safety and General Seamanship. If successful in passing these examinations, the cadets will receive their Watchkeeping Mate Certificate of Competence from Transport Canada. Transport Canada grants exam exemptions at various other certificate levels.

- Several other combinations of qualifications for Transport Canada certification for the Canadian coastal trade and offshore waters are possible through the diploma program. Students who are interested should contact the Marine Institute School of Maritime Studies or Transport Canada for further details.

- In addition to the certification opportunities described, graduates of the Marine Institute Diploma of Technology in Nautical Science are eligible for admission to the Memorial University Bachelor of Maritime Studies program. Upon completion of the diploma, candidates are required to complete 13 additional courses for the Bachelor of Maritime Studies degree.
DIPLOMA OF TECHNOLOGY - NAUTICAL SCIENCE

PROGRAM OUTLINE

Term 1
CHEM 1100 (Chemistry)
CMSK 1105 (Technical Communications I)
ENG 1105 (Engineering Graphics)
MATH 1112 (NASC Mathematics I)
NASC 1104 (Seamanship I)
PHYS 1104 (Physics)
SFTY 1104 (WHMIS)

Term 2
CMSK 1205 (Technical Communications II)
ELTK 1203 (Basic Electrical Technology)
MATH 1212 (NASC Mathematics II)
NASC 1204 (Seamanship II)
ONGR 1201 (Meteorology I)
PHYS 1204 (Physics)

Technical Session I
NASC 1303 (Shipboard Skills)
NASC 2107 (Restricted Operator’s Certificate - Maritime Commercial)
SFTY 1106 (Marine Advanced First Aid)
SFTY 1114 (Basic Safety - STCW’95 VII)
SFTY 1117 (Survival Craft - STCW’95 V12)
SFTY 1124 (Confined Space Entry Awareness)
SFTY 1129 (Security Awareness Training for Seafarers with Designated Security Duties)

Work Term
WKT M 2102 (Sea Phase II - Nautical Science)

Term 5
BSMG 3112 (Law and Environment)
MEK 3112 (Marine Engineering Knowledge)
NASC 3100 (Navigation)
NASC 3102 (Cargo Operations)
NASC 3210 (Navigation Systems & Instruments)
ONGR 3101 (Meteorology II)

Term 6
BSMG 3205 (Ship Management)
NASC 3200 (Navigation)
NASC 3208 (Stability)
NASC 3209 (Advanced Navigation Safety)
NASC 3211 (Seamanship III)
NASC 3212 (Navigation Systems and Instruments)

Technical Session 2
NASC 2207 (Communications)
NASC 3201 (GMDSS)
SFTY 1123 (Oil and Chemical Tanker Familiarization STCW’95 A-V1)

Work Term
WKT M 2102 (Sea Phase II - Nautical Science)

DIPLOMA OF TECHNOLOGY - NAVAL ARCHITECTURE

PROGRAM OVERVIEW

The Naval Architecture program is designed to prepare graduates to enter the workforce with a sound background in Naval Architecture technology along with a range of practical skills ready for use on their first day of employment.

Main Areas of Study:

• In the first year, students begin studying ship types and are introduced to the shipping business. Term 2 provides introductory courses in ship structures and marine engineering. The remaining courses in this year consist of foundation courses such as mathematics, physics, chemistry, materials study, and communication skills. Practical applications of commonly used computer software including spreadsheets, 2D draughting and presentation applications are addressed.

• Following Term 2 is a five-week intersession term which sets the foundation for further study in ship design and hull form.

• The second year concentrates on the fundamentals in the three core subject areas which define a Naval Architecture Technologist; ship stability, ship structures and production, and hull strength assessment. Associated with each subject area is practical skills development including the use of stability software and CAD software for traditional 2D ship’s drawings as well as 3D design applications.

• Following Term 4 of the second year is a five-week intersession term concentrating on marine systems and the economics of ship operations.

• The third and final year builds on the fundamentals of the three core subject areas as well as ship resistance and propulsion with each student completing an extensive ship design project beginning with a mission analysis and finishing with a complete preliminary ship design package. At the same time the student is introduced to offshore structures and composites for boats.

Characteristics of Graduates:

• Successful graduates of the Naval Architecture Technology program will have a proven work ethic and an excellent understanding of vessel design and construction practices, preparing them well for initial employment as a Naval Architect Technologist.

MISSON

The Naval Architecture program is designed to:

• Provide a strong technical education in naval architecture and shipbuilding technology.
• Prepare students for employment in shipyards and boat yards, consulting firms, research establishments, government agencies and the offshore oil and gas industry.
• Develop practical skills employed in ship and boat design, 2D and 3D draughting surveying and quality assurance

PROGRAM HIGHLIGHTS

• The Naval Architecture program is designed to prepare graduates to enter the workforce with a sound background in Naval Architecture technology along with a range of practical skills ready for use on their first day of employment.
• Following an introduction to computer aided draughting in the first year, students hone their skills in the use of AutoCAD over the next two years through extensive project work involving ships’ general arrangements, structural steel drawings and a variety of system schematics.

• The program recognizes the role being played by three dimensional computer modeling in modern ship design practice and includes training in many of today’s widely used three dimensional design tools such as Maxsurf and RhinoCoras.

• Building on the fundamentals of intact and damaged ship stability, students prepare a standard Trim and Stability booklet as required by Transport Canada for most registered ships. Software associated with stability analyses is introduced in the second year with further exposure, through project work, in the final year of study.

• In the second year the fundamentals of ship resistance and propulsion are studied including the determination of an appropriate engine and propeller for a given hull based on achieving maximum efficiency. Students will also have an opportunity to carry out model resistance tests taking advantage of Memorial’s clear water tank testing facility.

The following year, as part of an introductory course in composite hull construction, students will computer loft a hull and prepare a hull and prepare if for cutting on a computer controlled router, assemble the parts into a plug and build a mould that can be used for creating multiple hull parts.

• In the final year of the diploma program each student undertakes a ship design project for a vessel type of his own choosing. The project begins in September with a description of the ship’s mission and ends with a public presentation of the design at the end of May. A classic approach to the iterative process of ship design is taken and the final detail package includes; computer generated hull lines, general and machinery arrangements, capacity plan and structural drawings all supported by stability analyses, scantling determination from classification society rules, powering calculations and applicable national and international standards.
DIPLOMA OF TECHNOLOGY - NAVAL ARCHITECTURE

PROGRAM ENTRY
As per the Marine Institutes minimum entrance requirements for Diploma of Technology programs.

PROGRAM STRUCTURE
Length of the Program:
• Three academic years
Number of Semesters:
• Full time students will complete the program in six (6) 13 week semesters and three (3) 5 week Technical Sessions.
Number of Courses:
• Students must complete 48 courses in 3 years of study
Work Terms:
• There are no formal work terms associated with the program, however students frequently obtain summer employment in the industry between the second and third years of the program.
Topics Covered in each Semester:
• Refer to program calendar – Main Areas of Study

PROGRAM OUTLINE
Term 1
CHEM 1100 (Chemistry)
CMSK 1102 (Technical Communications)
ENGR 1103 (Engineering Graphics)
One of: MATH 1100 (Pre-Calculus)
or MATH 1101 (Introduction to Calculus)
NARC 1103 (Ships and Shipping)
PHYS 1100 (Physics)
SFTY 1104 (WHMIS)

Term 2
ENGR 1201 (Introduction to AutoCAD)
One of: MATH 1100 (Pre-Calculus)
or MATH 1101 (Introduction to Calculus)
or MATH 1200 (Calculus)
MECH 2102 (Mechanics)
MREK 2101 (Marine Engineering Knowledge)
MTPR 2104 (Materials and Processing)
NARC 1104 (Steel Ship Structure)
PHYS 1200 (Physics)

Technical Session 1
CMSK 1201 (Communication at Work)
CP SK 1300 (Computer Skills)
NARC 1101 (Ship Hull Geometry)

Term 3
ELTK 1100 (Electrotechnology)
MATH 1200 (Calculus)
MTPR 2100 (Strength of Materials)
NARC 2107 (Ship Building)
NARC 2108 (Outfitting)
NARC 2109 (Hydrostatics)

Term 4
ELTK 1200 (Electrotechnology)
MATH 2101 (Advanced Calculus)
MTPR 3100 (Strength of Materials)
NARC 2103 (Ship Stability)
NARC 2207 (Ship Building)
NARC 2208 (Ship Building)

Technical Session 2
ELTK 2104 (Electrotechnology)
MREK 2201 (Marine Engineering Knowledge)
MTPR 3201 (Strength of Materials)
NARC 2110 (Ship Operations Management)

Term 5
NARC 2201 (Resistance and Propulsion)
NARC 3102 (Ship Design)
NARC 3103 (Ship Structural Design)
NARC 3104 (Preliminary Design Project)
NARC 3108 (Boat Design - Composite Structure)
NARC 3203 (Hull Form Development Project)

Term 6
NARC 3106 (Stability)
NARC 3201 (Marine Electrical Project)
NARC 3202 (Marine Engineering Project)
NARC 3204 (Ship Structural Design Project)
NARC 3206 (Ship Arrangement Project)
NARC 3208 (Boat Design-Fabrication)

Technical Session 3
BSMG 3105 (Shipyard Management)
NARC 3209 (Offshore Structures)
NARC 3300 (Ship Design Project)

EVALUATION:
Not Applicable

PHYSICAL REQUIREMENTS
• (Where Applicable). There are no specific physical requirements required to enroll in the Naval Architecture program.

CAREERS
Naval Architecture graduates will be entering a broad and diverse field in ship and boat design, construction, and repair. The offshore oil and gas industry is also employing many graduates, along with various regulatory bodies such as Transport Canada, the American Bureau of Shipping, and Lloyd’s Register. While many work in an office environment, some jobs involve ship survey work or overseeing construction in shipyards or offshore. Graduates will be well prepared for a wide variety of these employment opportunities.

Types of Companies Graduate will find Work:
Graduates of the program typically work in shipyards, boatyards, general consulting firms, classification societies/ marine surveyors, marine offshore industries, research establishments and government agencies.

Type of Job Titles:
See Sample Job Description

Location:
Students typically find employment in Canada and the United States, and some graduates have found employment overseas.

Sample Job Description
Typical activities for a Naval Architect Technologist associated with job titles:

Hull Draftsman
• Prepare structural steel drawings for ships at the concept, preliminary and detail design stages.
• Plan new construction and repair work sequences for ship construction and repair
• Prepare work packages for various trades in the shipyard
• Estimate material and man-hour requirements for fabrication work

Chief Draftsman
• Perform design checks on preliminary design packages for bidding documents
• Schedule and manage drawing activities in the preparation design packages
• Determine drawing and man-hour requirements for ship repair or repair activities
• Design steel fabrication details for merchant and naval vessels

Consultant Naval Architect
• Design boats or ships to satisfy a stated purpose including specification, lines plan, general arrangement and structural layout, powering and machinery selection
• Perform stability assessments on ships
• Recommend and design changes to existing vessels to suit new vessel purposes.
• Design fixed or floating structures for the offshore oil and gas industry.

Ship Surveyor
• Inspect vessels for ship owners to determine overall condition or suitability for purchase.
• Survey vessels to ensure compliance with Transport Canada or other flag state regulations.
• Oversee vessel construction and repair projects to ensure compliance with Classification Society Rules.
• Inspect vessels to determine repairs required due to accidents or lack of maintenance.
### Mission
The Marine Engineering Technician program is specifically designed for Naval Engineering students pursuing a career with the Canadian Navy. Courses are designed to provide a solid foundation for the understanding of engine room machinery and auxiliary equipment, as well as engine room operations.

### Program Overview
Main areas of study:
- Marine Engineering Knowledge
- Workshop practice and Machining
- Electrotechnology
- Electronics and Instrumentation

Accreditation Status:
The Marine Engineering Technician program is nationally accredited by the Canadian Council of Technicians and Technologists/ Canadian Technology Accreditation Board

### Program Entry
Please refer to the Admissions section of this Calendar.

### Physical Requirements
Applicants seeking entry into the marine Engineering Technician program must meet Canadian Navy physical fitness criteria.

### Program Structure
Length of the Program:
- 2 Years

Number of Semesters:
- 4 Academic Terms

Number of Courses:
- 26 courses

Evaluation:
The minimum passing grade for all courses in the Marine Engineering Technician program is 50%. A cumulative average of 60% must also be maintained throughout the course of the program.

### Program Outline
**TERM 1**
- CMSK 1100 (Introduction to Technical Reporting)
- ELTK 1100 (Electrotechnology)
- ENGR 1101 (Engineering Drawing)
- MATH 1100 (Pre-Calculus)
- MREK 2103 (Marine Engineering Knowledge)
- PHYS 1100 (Physics)
- SFTY 1104 (WHMIS)
- WKPR 1103 (Fitting Shop)

**TERM 2**
- CHEM 1100 (Chemistry)
- CMSK 1200 (Technical Reporting)
- ELTK 1200 (Electrotechnology)
- MATH 1101 (Introduction to Calculus)
- MECH 1100 (Mechanics)
- MREK 2203 (Marine Engineering Knowledge)
- WKPR 1104 (Machine Shop)

**TERM 3**
- CNTL 2102 (Instrumentation, Controls and Automation)
- ELTK 2103 (Electrotechnology)
- ELTR 1101 (Electronics for Instrumentation)
- FLDS 2100 (Fluid Mechanics)
- MREK 3103 (Marine Engineering Knowledge)
- TRMO 2101 (Thermodynamics)

**TERM 4**
- CNTL 2105 (Electro-Mechanical Logic)
- CNTL 2202 (Instrumentation, Controls & Automation)
- FLDS 3100 (Hydraulics and Pneumatics)
- MREK 3201 (Marine Engineering Knowledge)
- MREK 3203 (Marine Engineering Knowledge)
- TRMO 3101 (Applied Thermodynamics - Refrigeration and Air Conditioning)

### Program Highlights
This program is designed to graduate students with a variety of strengths that can be used in a large array of employment areas.

- Discipline-related and application courses are supplemented by further courses in Engineering Drawing and Chemistry to support course content.
- The program prepares students for employment with the military, technical sales, and engineering companies in both marine and land-based installation, maintenance, calibration, and repair. This preparation is supported by courses in Hydraulics, Instrumentation, Electronics and Controls.
- Some students find employment as technicians on board ships, and this is reflected by the inclusion of marine applications in many courses.
- The program is designed to meet the ongoing requirements of the Canadian Navy for the academic and technical education of Technicians responsible for repair and operation of marine systems on board Canadian Navy vessels.

Potential students should call their local recruiting centre at 1-800-856-8488 and indicate your interest in Navy programs at the Marine Institute. Interested candidates will also find more information on line at the following site:
http://www.forces.ca/en/job/marineengineer-31
MISSION

The two year ROV program is designed to:
• Train students in ROV piloting, in hydraulics, electronics and electrical maintenance, and in underwater navigation.
• Train students in ROV deployment methodologies that encompass safety, inspection, and operation.
• Prepare students for careers in underwater intervention in offshore oil & gas, nuclear, military, law enforcement, pipeline and cable industries as a substitute to diving operations
• Graduate students with a 2-year Technician Diploma.

PROGRAM OVERVIEW

The ROV program is designed to prepare graduates to enter the workforce with a sound background in electronics, hydraulics, and electrical and workplace safety.

Main Areas of study:
• In the first year, students begin studying math, physics, electro-technology, digital logic, and computer programming. ROV systems are introduced as well as courses in oceanography, fluid mechanics, ROV electronics, and underwater acoustics. Written communication and computer programming is another feature of this first year.
• Following Term 2, the 6 week Technical Session 1 teaches hands-on experience with electronic and mechanical fabrication and drafting, instrumentation used on ROV’s, and ROV piloting via simulators. A basic seamanship course introduces students to life at sea.
• The second year focuses on ROV operations and maintenance. It covers advanced hydraulics, industrial electronics & controls, and electrical machines, maintenance, and safety. A workshop practice course adds a practical dimension to the theoretical knowledge. ROV launch, recovery, and maintenance duties form a major part of work for the graduates in the ROV industry. On the operational side, computer interfacing techniques, data communication, and acoustic applications help in understanding the internetworked systems that comprise an ROV.
• Term 4 is followed by the 6 week Technical Session 2 in which students receive hands-on experience piloting ROVs in open water and honing those skills in the simulator. This technical session also includes marine safety training required to work in the offshore industry.
• Following Technical Session 2, students are required to complete an 8 week (320 hour) work term in the local or international ROV industry.

Characteristics of Graduate
Successful ROV Pilot / Technician graduates will have a proven work ethic and an excellent understanding of ROV design, operations and maintenance including safely launching, piloting, and repairing ROVs; preparing them for initial employment as a ROV technician/technician on their first ROV crew.

Accreditation Status
• The ROV program is accredited under the Dublin Accord as an Electronics Technician program by the Canadian Technology Accreditation Board (CTAB).
• Graduates are recognized by the Diver Certification Board of Canada (DCBC) and are eligible to register with DCBC as an ROV Operator.

PROGRAM ENTRY

Direct Entry
Program entry regulations are as per the Marine Institutes minimum entrance requirements for Technician Diploma Programs. Refer to the Admissions Section of the Marine Institute Calendar.
Applicants should possess strong skills in both mathematics and science to enter this program

Advanced Standing

Refer to Admissions section of this Calendar for general information regarding Advanced Standing. Applicants, who have completed a three-year diploma of technology in either Electrical, Electronics, Mechanical, or Marine Engineering at another accredited post-secondary institution, or at the Marine Institute, may be eligible to receive Advanced Standing in the program. Advanced Standing students commence their studies in Term 3 of this program, with the possibility of requiring a three week bridging program to take place before the start of the Term 3 fall academic semester.

PROGRAM STRUCTURE

Length of the Program:
• 2 academic years (1 year for Advanced Standing students)
Number of Semesters:
• Four (4) 13 week academic semesters, two (2) technical sessions and one (1) 8 week work term
Number of Courses:
• 38 courses in 2 years of study

Work Terms:
• Students do a 8 week (320 hour) work term at the end of Term 4

Topics covered in each semester
• Refer to program calendar – Main areas of study

PHYSICAL REQUIREMENTS

Proof of physical fitness must be provided by way of a valid CAPP (Canadian Association of Petroleum Producers) offshore medical from an approved physician for registration in this program. Contact the Registrar’s Office for a list of physicians approved to conduct the CAPP medical.

PROGRAM OUTLINE

TERM 1
CMSK 1104 (Introduction to Technical Reporting)
ELTK 1103 (Introduction to Electrotechnology Applications)
ELTR 2102 (Digital Logic)
MATH 1101 (Introduction to Calculus)
ONGR 1200 (Descriptive ONGR)
SFTY 1104 (WHMIS)

TERM 2
CPSK 1102 (Introduction Applied Programming)
ELTR 1301 (Control Electronics for ROV)
FLOD 2108 (Introduction to Fluid Mechanics & Hydraulics)
OMAP 2000 (Underwater Acoustic Applications)
PHYS 1101 (Physics)
ROVO 2200 (Introduction to ROV Systems)

TECHNICAL SESSION 1
ELTR 1104 (Electro-Mechanical Systems (LARS))
ENGR 1303 (ROV Drafting and Blueprints)
NASC 1304 (Seamanship for Ocean Technology Technicians)
ONGR 1301 (Instrumentation Oceanography)
ROVO 1300 (ROV Simulator - Introduction)
ROVO 1301 (ROV Tooling)
WKPR 1306 (Computer Numerical Controlled (CNC) Fabrication)

TERM 3
CMSK 2103 (Soft Skills for Ocean Technology Technicians)
ELTK 1303 (Electrical Machines and Power Systems)
ELTR 2118 (High Voltage Safety)
FLOD 2109 (Advanced Hydraulics)
ONGR 1200 (Descriptive ONGR) For Advanced Standing Students Only
ROVO 2201 (ROV Operations)
ROVO 2200 (Introduction to ROV Systems) For Advanced Standing Students Only
WKPR 2118 (Workshop Practice)

TERM 4
ELTK 2200 (Marine Electrical Troubleshooting)
ELTR 2115 (Data Communications)
ELTR 2116 (Industrial Electronic and Controls)
ELTR 2215 (Microcomputer Interfacing)
OMAP 2000 (Underwater Acoustic Applications) For Advanced Standing Students Only
ROVI 2205 (ROV Maintenance and Launch and Recovery Systems (LARS))

TECHNICAL SESSION 2
ROVO 2300 (ROV Ship Interaction)
ROVO 2301 (ROV Pilot Training)
ROVO 2303 (ROV Simulator - Advanced)

Types of Companies Graduate will find Work
• Graduates of the program typically find work in AUV/ROV manufacturing companies, marine offshore industries, nuclear, military, law enforcement, and pipeline and cable industries.

Types of Job Titles
• ROV Pilot
• ROV Operator
• ROV Technician
• ROV Supervisor
• See Sample job description below

Location
• The industry is a global one and graduates should expect to work in various locations around the world.

SFTY 1122 (Basic First Aid (STCW A-VI/1-3))
SFTY 1128 (BST - Basic Survival Training)
SFTY 1134 (Security Awareness Training for Seafarers without Designated Security Duties)
SFTY 2101 (H2S Alive)
SFTY 2201 (Fall Protection)
WKTM 1105 (Work Term (320 hours))
**TECHNICAL DIPLOMA - REMOTELY OPERATED VEHICLES (ROV OPERATOR)**

**Interact with ROV Supervisor to ensure efficient operations:**
- Present clients with optimal operational scenarios
- Engage in project planning for acquisition and deployment

**ROV Superintendent:**
- Participates in daily planning of offshore installation activity
- Accepts responsibility for documentation of ROV operations
- Participates in daily planning of offshore installation activity

**ROV Pilot/Technician:**
- Accepts responsibility for safety and effective ROV operations
- Accepts responsibility for documentation of ROV operations
- Participates in daily planning of offshore installation activity

**Sample Job Description**

ROV Pilot/Technician

- Repair and maintain Remotely Operated Vehicles and the associated support systems including Tether Management Systems, Winch and Launch and Recovery Systems, and Power Generation Systems
- Perform electrical, electronic, hydraulic and mechanical maintenance and repair duties for a multitude of electro- hydraulic/mechanical systems
- Perform piloting duties for a multitude of subsea tasks including general visual inspections, survey, specialty tooling operation, construction, installation, pipeline and cable laying, search, salvage and recovery, and offshore oil drilling support
- Perform support duties including navigation and sonar operation, multimedia recording and record keeping, manipulator operation, inventory, planned and preventative maintenance, updating system specifications, logs and registers
- Opportunity to work globally

**ROV Supervisor**

- Act as team lead for operation, maintenance, and repair of Remotely Operated Vehicle
- Plan ROV missions
- Act as liaison between ROV crew and vessel
- Accept responsibility for safe and effective ROV operations
- Accepts responsibility for documentation of ROV operations
- Participates in daily planning of offshore installation activity

**ROV Superintendent**

- Engage in project planning for acquisition and deployment of Remotely Operated Vehicles and crews
- Interface with clients to determine ROV requirements and activity
- Present clients with optimal operational scenarios
- Interact with ROV Supervisor to ensure efficient operations

**CAREERS**

**Information about the industry**
- Remotely Operated Vehicles (ROV) and Autonomous Underwater Vehicles (AUV) are used most notably in the offshore oil and gas, nuclear, military, law enforcement, marine, pipeline, and cable industries, as a substitute or supplement to commercial (manned) diving operations. These vehicles are especially suited for hazardous and difficult underwater operations.
- Due to the increased complexity in ROV/AUV operations, offshore operators have started to demand a higher level of quality assurance for ROV operators. Skills required by ROV/AUV operators include piloting, hydraulics, electrical & electronics and general workplace safety. There are few educational institutions in the world that offer ROV training.

**TECHNICAL CERTIFICATE - AQUACULTURE (MUSSEL)**

**Program Entry**

Applicants should possess the equivalent of Grade 9 education or be eligible for entry under mature student status.

**Program Structure**

The method of instruction and course delivery will be a combination of theoretical and practical learning, for core and elective courses. The program will also include field-based assessments and practical, hands-on experience. The program will run for a total of 11-12 weeks, with a minimum of 56 days.

**Core Courses**

- Mandatory Courses and Work Experience
  - 5 Mandatory Courses and 1 Work Experience. Composed of:
    - 2 Basic Safety Courses
    - 3 Mussel Sector courses
    - 1 Work Experience (minimum of 25 days; work time credited after completion of 3 Mussel Sector core courses)

**Elective Courses**

- 7 Elective Courses in total
  - 1 from ELECTIVES (Safety)
  - 6 from ELECTIVES (Mussel and Other Sector)

**Total Courses Required to Complete Technical Certificate — Aquaculture (Mussel):**

- 12 Courses
- 1 Work Experience

Total Program Duration: Minimum 56 days (11-12 weeks)

**Program Outline**

**CORE — Complete ALL**

- SFTY 1125 (Small Vessel Operator Proficiency)
- SFTY 1102 (Marine Basic First Aid (STCW A-VI/1-3))
- 500534 (Mussel Spat Collection and General Biology)
- 500535 (Mussel Farm Stocking Capacity)
- 500536 (Mussel Harvesting, Handling and Processing)
- 500539 (Aquaculture Work Experience)

**ELECTIVES (Safety) — Complete 1 course**

- SFTY 2012 (MDE A3 - Marine Emergency Duties for Small Vessels)
- MARP 0004 (500542) (Marine Hydraulics)
- MARP 0005 (500543) (Small Diesel Repair and Maintenance)
- FITE 0005 (500547) (Ropework)
- SFTY 0001 (500545) (Basic Boat Skills)
- 500544 (Vessel Maintenance)
- 500541 (Farm-Based Quality Certification)

**ELECTIVES (Mussel and Other Sector) — Complete 6 courses**

- 500537 (Mussel Site Maintenance)
- 500538 (Mussel Marketing and Management)
- 500548 (Basic Mathematics for Aquaculture Workers)
- 500523 (Outboard Motor Maintenance)
- 500540 (Basic Farm Safety)
- 500541 (Farm-Based Quality Certification)

**Program Outline**

**CORE — Complete ALL**

- SFTY 1125 (Small Vessel Operator Proficiency)
- SFTY 1102 (Marine Basic First Aid (STCW A-VI/1-3))
- 500534 (Mussel Spat Collection and General Biology)
- 500535 (Mussel Farm Stocking Capacity)
- 500536 (Mussel Harvesting, Handling and Processing)
- 500539 (Aquaculture Work Experience)

**ELECTIVES (Safety) — Complete 1 course**

- SFTY 2012 (MDE A3 - Marine Emergency Duties for Small Vessels)
- MARP 0004 (500542) (Marine Hydraulics)
- MARP 0005 (500543) (Small Diesel Repair and Maintenance)
- FITE 0005 (500547) (Ropework)
- SFTY 0001 (500545) (Basic Boat Skills)
- 500544 (Vessel Maintenance)
- 500541 (Farm-Based Quality Certification)

**ELECTIVES (Mussel and Other Sector) — Complete 6 courses**

- 500537 (Mussel Site Maintenance)
- 500538 (Mussel Marketing and Management)
- 500548 (Basic Mathematics for Aquaculture Workers)
- 500523 (Outboard Motor Maintenance)

**Program Outline**

**CORE — Complete ALL**

- SFTY 1125 (Small Vessel Operator Proficiency)
- SFTY 1102 (Marine Basic First Aid (STCW A-VI/1-3))
- 500534 (Mussel Spat Collection and General Biology)
- 500535 (Mussel Farm Stocking Capacity)
- 500536 (Mussel Harvesting, Handling and Processing)
- 500539 (Aquaculture Work Experience)

**ELECTIVES (Safety) — Complete 1 course**

- SFTY 2012 (MDE A3 - Marine Emergency Duties for Small Vessels)
- MARP 0004 (500542) (Marine Hydraulics)
- MARP 0005 (500543) (Small Diesel Repair and Maintenance)
- FITE 0005 (500547) (Ropework)
- SFTY 0001 (500545) (Basic Boat Skills)
- 500544 (Vessel Maintenance)
- 500541 (Farm-Based Quality Certification)

**ELECTIVES (Mussel and Other Sector) — Complete 6 courses**

- 500537 (Mussel Site Maintenance)
- 500538 (Mussel Marketing and Management)
- 500548 (Basic Mathematics for Aquaculture Workers)
- 500523 (Outboard Motor Maintenance)
This technical certificate-level program designed to up-grade the skills of existing salmonid farm workers and to train new employees for entry into the salmonid aquaculture industry.

**PROGRAM ENTRY**

Applicants should possess the equivalent of Grade 9 education or be eligible for entry under mature student status.

**PROGRAM STRUCTURE**

The method of instruction and course delivery will be a combination of practical and theory utilizing classrooms for community-based instruction (i.e. near fish farming regions) and access to local farm sites for some practical components.

**CORE COURSES**

- 5 Mandatory Courses and 1 Work Experience. Composed of:
  - 2 Basic Safety courses
  - 3 Salmonid Sector courses
  - 1 Work Experience (minimum of 25 days; work time credited after completion of 3 Salmonid Sector core courses)

**ELECTIVE COURSES**

- 7 Elective Courses in total
  - 1 from ELECTIVES (Safety)
  - 6 from ELECTIVES (Salmonid and Other Sector)

Total Courses Required to Complete Technical Certificate — Aquaculture (Salmonid)

- 1 Work Experience
- 1 Course
- 1 Work Experience

Total Program Duration: Minimum 56 days (11-12 weeks)

**PROGRAM OUTLINE**

**CORE — Complete ALL**

- SFTY 1125 (Small Vessel Operator Proficiency)
- SFTY 1102 (Marine Basic First Aid (STCW A-VIII-1))
- 500524 (Salmonid Biology and Husbandry)
- 500525 (Salmonid Feeds and Feeding)
- 500526 (Salmonid Health and Biosecurity)
- 500539 (Aquaculture Work Experience)

**ELECTIVES (Safety) — Complete 1 course**

- SFTY 2102 (iMED A3 - Marine Emergency Duties for Small Vessels)
- NASC 2107 (Restricted Operator’s Certificate – Maritime Commercial)

**ELECTIVES (Salmonid and Other Sector) — Complete 6 courses**

- 500549 (Salmonid Cage Maintenance)
- 500531 (Salmonid Site Maintenance)
- Aqua 0006 (500532) (Salmonid Harvesting, Handling and Processing)
- 500533 (Salmonid Hatchery and Recirculation Technology)
- 500548 (Basic Mathematics for Aquaculture Workers)
- 500523 (Outboard Motor Maintenance)

This is an introductory course designed to give workers/participants the basic knowledge and understanding of the feeds and feeding of cultured salmonids. It includes the principles of using fish feeds, implications of inappropriate feeding, handling and storing feeds, and monitoring of effective feeding strategies.
This is a technical certificate-level program designed to up-
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general environmental maintenance procedures. This course will be designed to give workers/participants an opportunity to learn, develop and practice high standards of professional behaviour and performance while in the work environment.

**ELECTIVES (Safety):**

- **SFTY 2102 (MED A3 - Marine Emergency Duties for Small Vessels)**
  This is a marine emergency duties course designed for crew members of non-pleasure vessels of not more than 150GT which operate not more than 20 miles from shore.

- **NASC 2107 (Restricted Operator’s Certificate – Maritime Commercial)**
  This course provides participants with the knowledge and practical skills to effectively operate and communicate using the Global Maritime Distress and Safety System, as outlined in the International Maritime Organization’s Resolution A 769 (18).

- **AQUA 0014 (500540) (Basic Farm Safety)**
  This course will be designed to give workers/participants an understanding of the importance of basic farm safety practices and procedures. It includes Workplace Hazardous Materials Information System (WHMIS), Occupational Health and Safety (OHS), accident incident reporting, and hazards related to various farm systems and activities (e.g. boating, loading and harvesting systems, storage).

- **SFTY 0002 (202310) (Oil Spill Response Awareness)**
  This will be an awareness-level course that will provide participants with basic knowledge in oil spill response.

- **ELECTIVES (Salmonid and Other Sector):**
  - **500549 (Salmonid Cage Maintenance)**
    This course will be designed to give workers/participants an understanding of principles and maintenance of floating cage/open containment systems for salmonids. It will include information on types of cage design, the function of the cage components, the monitoring and maintenance of cage condition, and basic emergency repair skills.
  - **500531 (Salmonid Site Maintenance)**
    This course will be designed to give workers/participants basic salmonid site maintenance skills. It will include maintenance practices for farm safety, avoidance of fish escapes and husbandry issues, code of containment and escape responses, basic farm equipment maintenance schedules and records, and general environmental maintenance procedures.
  - **500532 (Salmonid Harvesting, Handling and Processing)**
    This course will be designed to give workers/participants an understanding of the principles of harvesting, handling and processing salmonids to ensure optimal flesh quality for the marketed product. It will include basic sanitation and quality control, the importance of good harvesting and handling procedures to maintain flesh quality and avoid stresses on the fish, basic primary and secondary processing methods, and the importance of harvest record keeping.
  - **500533 (Salmonid Hatchery and Recirculation Technology)**
    This course will be designed to give workers/participants an understanding of the principles of broodstock and early rearing husbandry, particularly for hatchery operations. It will include basic water quality criteria for incubation and fry/juvenile rearing systems, issues related to feeding and health maintenance, record keeping, and the components of recirculation technology.
  - **500548 (Basic Mathematics for Aquaculture Workers)**
    This course will be designed to give workers/participants knowledge of basic mathematical calculations related to stocking densities, feeding protocols, health and sanitation treatments, harvesting, transporting, record keeping, and other fish farm practices.
  - **500523 (Outboard Motor Maintenance)**
    This course will be designed to give workers/participants a working knowledge of marine hydraulic systems, along with the working knowledge of small diesel technology, repair and service. The student will also learn the correct use of hand tools, special tools, and testing equipment associated with the small diesel.
  - **500542 (Marine Hydraulics)**
    This course will be designed to give workers/participants a working knowledge of marine hydraulic systems, along with the knowledge to maintain and troubleshoot hydraulic systems.
  - **500543 (Small Diesel Repair and Maintenance)**
    This will be an introductory course to the repair and maintenance of small diesel engines. It will provide students with an understanding of small diesel technology, repair and service. The student will also learn the correct use of hand tools, special tools, and testing equipment associated with the small diesel.
  - **FITE 0005 (500547) (Ropework)**
    This course will be designed to develop the participant’s ability to understand the design and construction of various types of ropes, maintenance and inspection of ropes, and regulations governing rope usage. It will include rope safety, use and maintenance for small vessels, moorings and anchoring, and other aquaculture systems. It will be a prerequisite for Salmonid Cage Maintenance course.
  - **SFTY 0001 (500545) (Basic Boat Skills)**
    This course will be designed to give workers/participants with an increased awareness and knowledge of the small boat safety and skills related to aquaculture activities. It will include theory and practical skills components for inexperienced workers to orient them to basic navigation, proper handling, docking, loading and other fundamental boat skills. This will also include the ‘Cold Water’ Boot Camp survival.
This eight month Technical Certificate Program is designed:

- to prepare the student for employment in the merchant marine or fishing industry,
- to provide the student with a basic understanding of the organization and structure found on a typical merchant marine or fishing vessel,
- to develop and gain the knowledge and experience necessary to become part of a crew as found on any seagoing vessel.

**PHYSICAL REQUIREMENTS**

Applicants seeking entry to Marine Institute programs which lead to Transport Canada Certification for Seafarer’s should note that Transport Canada requires proof of satisfactory physical fitness prior to eligibility for a Transport Canada Certificate of Competence. This includes satisfactory visual acuity, colour vision, and hearing among other physical requirements.

These Programs include the Marine Institute Diplomas of Technology in Nautical Science, Marine Engineering, the Vocational Certificate in Marine Diesel Mechanics and the Technical Certificate in Bridge Watch Program. Proof of physical fitness is also required for students to participate in STCW Marine Safety Training which is a compulsory part of these Programs.

Proof of physical fitness must be provided by way of a signed medical from an approved physician. Signed Seafarer’s medical from an approved physician are required for admission to each respective program. The list of physicians approved to conduct the Seafarer’s medical are available from the Marine Institute Office of the Registrar. Details of the physical requirements for the Seafarer’s Medical may be obtained from Transport Canada at the following address:

Marine Safety Directorate
John Cabot Building, 10 Barter’s Hill
P.O. Box 1300, St. John’s, NL A1C 6H8
(709) 772-5167

**PROGRAM ENTRY**

Please refer to Admissions section of this Calendar.

**PROGRAM STRUCTURE**

The overall objective of this program is to train students in the skills of seamanship so they will be employable in the marine industry.

This program provides training and work experience to facilitate the transition of participants from school to the labour market, as well as offering a retraining opportunity. The design of this program includes the necessary academic skills training, as well as, the skills necessary to fill the position of deckhand. The many aspects of training in this program focus on preparing graduates to function and work confidently in the marine industry. The eight (8) month program is divided into two sections - Off-Site and On-Site training:

- 16-weeks in-class instruction
- 3-weeks Marine Safety Training
- 60 days sea placement

Students undertake hands-on training where appropriate, using facilities in the Marine Institute’s rigging room, simulator, and its training vessel.

**TECHNICAL CERTIFICATE - BRIDGE WATCH PROGRAM**

**CAREERS**

- Graduates can expect to find employment in the marine industry aboard cargo and passenger ships, supply vessels, oil tankers, and fishing vessels.
- Employment in the allied marine industries may also be available.
- This program may be especially useful to fisher persons who have been displaced due to a downturn in the fishing industry. However, applicants should aim to upgrade and move into another aspect of the trade.
- Upon successful completion of the program students are eligible to write the Bridge Watch Rating examination with Transport Canada.

**PROGRAM OUTLINE**

**Credit Earned:** Technical Certificate

**Duration:** 8 months

**Normal Start:** September

**School of Maritime Studies**

- Contact: Admissions Officer
- (709) 778-0380
- 1-800-563-5799 (ext. 380)
- email: admissions@mi.mun.ca
This is a two semester Program, plus an eight week Workterm, delivered at the Safety and Emergency Response Training (SERT) Centre in Stephenville, NL. It is based on internationally recognized NFPA standards. The courses are taught by full-time, certified faculty and part-time Fire Service personnel.

Students attend lectures in a modern classroom setting and complete realistic skills training in a "live fire" training facility. They gain practical experience by using modern fire suppression equipment in a simulated fire station environment.

To receive the FIRE RESCUE program certificate students must pass all courses within the program and earn certifications from an NFPA accredited agency in the following:
1. NFPA 1006 - Technical Rescuer - Rope Rescue Levels I and II
2. NFPA 1006 - Technical Rescuer - Confined Space Entry Levels I and II
3. NFPA 1006 - Technical Rescuer - Vehicle Extrication Levels I and II
3. NFPA 1001 Level 1 (Fire Fighter 1)
4. NFPA 1001 Level 2 (Fire Fighter 2)
5. NFPA 1002 (Fire Pumper/Driver Operator).

Please note:
All NFPA testing is conducted by an External Agency. No oral examination will be available for NFPA testing.

PROGRAM ENTRY
Please refer to the Admissions section of this Calendar.

Please Note:
Physical fitness is required for employment as a fire fighter. Therefore, a SERT Fitness test will be administered in the first week of the program. Students will use the results of this test to prepare for the second SERT Fitness test. Successful completion of the second Physical Fitness Test conducted in Semester Two is prerequisite to work term commencement. During this second Physical Fitness Test, Students will be required to wear full turnout gear and SCBA. Timeline required for successful completion is under 10 minutes.

PHYSICAL REQUIREMENTS
Successful completion of all courses within the Fire Rescue Program.
Successful Completion of NFPA Level 1 Certification
Successful Completion of Physical Fitness Test conducted in Semester Two. During this second Physical Fitness Test, Students will be required to wear full turnout gear and SCBA. Timeline required for successful completion is under 10 minutes.
Clear Code of Conduct document from a Police Department.

CAREERS
The graduate of this program will be qualified for a recruit level position with a municipal or industrial fire department.
MISSION
This program is designed to provide the technical and practical knowledge necessary to run, maintain and repair marine diesel engines and associated equipment.

PROGRAM OVERVIEW
Main Areas of Study:
- Marine Engineering Knowledge
- Electrotechnology
- Machine Shop Practice
- Welding Practice
- Engineering Drawing

Accreditation Status:
Transport Canada and Canadian accreditation towards Practical Skills Training and Engine Room Rating Certification.

PHYSICAL REQUIREMENTS
Applicants seeking entry to Marine Institute programs which lead to Transport Canada Certification for Seafarer’s should note that Transport Canada requires proof of satisfactory physical fitness prior to sitting for any Transport Canada exams. This includes satisfactory visual acuity, colour vision, and hearing among other physical requirements...

Proof of physical fitness is also required for students to participate in Marine Emergency Duties (MED) Training which is a compulsory part of these programs.

Proof of physical fitness must be provided by way of a signed medical from an approved physician. Signed Seafarer’s medical from an approved physician is required for admission to this program. The list of physicians approved to conduct the Seafarer’s medical is available from the Marine Institute Office of the Registrar. Details of the physical requirements for the Seafarer’s Medical may be obtained from Transport Canada at the following address:

Marine Safety Directorate
John Cabot Building, 10 Barter’s Hill
P.O. Box 1300, St. John’s, NL A1C 6H8
(709) 772-5167

PROGRAM ENTRY
Please refer to the Admissions section of this Calendar.

PROGRAM STRUCTURE
Length of the Program:
- 1 Year

Number of Semesters:
- 2 Academic Terms + 5 weeks safety related courses + work term

Number of Courses:
- 20 courses, including all required safety courses

Work Terms - 2 Options
- 1 Work Term either 60 days (ship based) or 50 days (land based)

PROGRAM OUTLINE
Term 1
CMSK 0102 (Communication Skills)
ELTK 0102 (Electro-technology)
ENGR 0108 (Engineering Graphics)
MATH 0102 (Mathematics)
MREK 0101 (Marine Engineering Knowledge)
SFTY 1104 (WHMIS)
WKPR 0100 (Fitting Shop)

Term 2
BSMG 0202 (Workplace Preparation)
CMSK 0202 (Communication Skills)
ELTK 0200 (Electro-technology)
MATH 0200 (Mathematics)
MREK 0200 (Marine Engineering Knowledge)
MREK 0201 (Ship Stability and Construction)
WKPR 0103 (Welding Practice)
WKPR 0200 (Machine Shop)

These safety courses will be taken following Term 2:
SFTY 1102 (Marine Basic First Aid (STCW A-VI/1-3))
SFTY 1114 (Basic Safety - STCW’95 VI/II)
SFTY 1117 (Survival Craft - STCW’95 V1/2)
SFTY 1123 (Oil and Chemical Tanker Familiarization STCW’95 A-V1)
SFTY 1124 (Confined Space Entry Awareness) - To be delivered after SFTY 1123
SFTY 1129 (Security Awareness Training for Seafarers with Designated Security Duties)

Work Term
WKTM 0100 (Work Term - Marine Diesel Mechanics)

CAREERS
Graduates of the Marine Diesel Mechanics Technical program can expect to gain employment as an Engine Room Rating on merchant vessels including those of The Canadian Coast Guard. Employment can also be found on board offshore drilling platforms, at marine service centres, marine fabrication and repair yards as well as in the marine engine service industry.

PROGRAM HIGHLIGHTS
This program prepares graduates for either successful sea-going career as an engine room rating or a shore based career as an engine technician

Students may complete either a 60 day sea-going work term or a 50 day shore based work term.

Transport Canada Certification
Upon graduation Transport Canada recognizes this program as meeting both the Practical Skills Training for Marine Engineers and the Engine Room Rating Training Program requirements. Upon successful completion of a Transport Canada approved (60 day) work term the graduate may qualify to write the Transport Canada Engine Room Rating Certificate exam (proof of graduation and eligible sea service must be submitted to Transport Canada)

Sample Job Descriptions:
Sea Based
- Work as an engine room rating onboard commercial or government vessels, work as a mechanic on oil drilling platforms.

Shore Based
- Work as an engine mechanic in engine repair shops or as a marine technician in marine industrial fabrication/repair facilities.
TRANSPORT CANADA PROGRAMS

Under the Canada Shipping Act, Transport Canada has the responsibility for the examination and certification of seafarers in Canada. Under the same legislation, specific regulations and related Transport Publications1, spell out the details which govern the rights and responsibilities of seafarers who hold either deck or marine engineering Certificates of Competence (Certificates) issued by Transport Canada.

Part of the federal responsibility, in addition to enacting and enforcing the rules and regulations, is to provide the opportunity for seafarers to attend education and training institutions and receive the appropriate preparation for such examinations. To carry out this mandate Transport Canada has designated several schools in Canada as being approved for these purposes. The Fisheries and Marine Institute of Memorial University of Newfoundland is a designated institution.

The Marine Institute carries out its agreements with Transport Canada in several ways. These include the sponsoring of schools in Canada as being approved for these purposes. The Fisheries and Marine Institute of Memorial University of Newfoundland is a designated institution.

The emphasis of these courses is to train personnel who have the necessary sea-going experience to challenge each level of certification. Offerings are always subject to sufficient demand and schedules are prepared each year for the more common and popular certification programs. While the Marine Institute may not address certain certificates in its schedule of courses in any given period, if there is sufficient industry interest, then the Marine Institute will offer courses to meet that demand.

NOTE

1 The Regulations are the Marine Personnel Regulations. The guidelines to these regulations are contained in Transport Canada publication TP2293E. These regulations and guidelines are available at the nearest Transport Canada office, on the World Wide Web at http://laws.justice.gc.ca/eng/regulations/SCR-2007-115/ or the library at the Marine Institute.
AQUACULTURE WORK EXPERIENCE

This work experience is designed to provide the student with practical experience in salmonid or mussel farm operations. To meet the graduation requirements of the Technical Certificate in Aquaculture, the student must successfully complete the Aquaculture Work Experience.

Prerequisites - For those enrolled in the Technical Certificate in Aquaculture (Salmonid), successful completion of core courses:
• Salmonid Biology and Husbandry (SRS 500524);
• Salmonid Feeds and Feeding (500525); and
• Salmonid Health and Biosecurity (500526).

For those enrolled in the Technical Certificate in Aquaculture (Mussel), successful completion of core courses:
• Mussel Spat Collection and General Biology (500534);
• Mussel Farm Stocking Capacity (500535); and
• Mussel Harvesting, Handling and Processing (500536).

Schedule - Minimum of 175 hours (25 days)

AQUA 0006 (Salmonid Harvesting, Handling and Processing)

This course is designed to enable aquaculture workers to gain understanding of the important role harvesting, handling and processing has on product quality and food safety.

Harvesting; Handling and Holding; Processing

Duration - 2.5 days

AQUA 0014 (Basic Farm Safety)

This course is designed to give workers/participants an understanding of the importance of basic farm safety practices and procedures. It includes Occupational Health and Safety (OH&S), accident incident reporting, hazards related to various farm systems and activities (e.g. boating, loading and harvesting systems, storage), and safe work procedures.

Workplace Health Safety and Compensation Commission (WHSCC); Occupational Health and Safety (OH&S); Hazards; New and Young Workers; Personal Protective Equipment (PPE); Safe Work Practices and Procedures

Prerequisite - WHMIS or SFTY 1104 (WHMIS)

Duration - 2.5 days

AQUA 4100 (Aquaculture Seminar Series)

This course will present selected topics of relevance to the development of the aquaculture industry.

Cod Farming; Rainbow Trout; Salmon Farming; Other Marine Fish; Eat, Fish Food Production; Mussel Culture; Scallop Culture; Other Shellfish; Provincial Government (Aquaculture Mandate); Federal Government (Aquaculture Mandate); The Role of Aquaculture Associations; Student, Faculty, Visiting Lecturer Presentations

Duration - 13 weeks

Lectures - 1.5 hours/week

AQUA 4101 (Handling & Processing Aquaculture Products)

This course is designed to familiarize aquaculture students with the handling, processing and preservation of Newfoundland & Labrador farmed fish and shellfish.

Fisheries Overview; Product Costing; Food Safety and Quality Control; Overview of Sanitation; Farmed White Fleshed Fish Handling and Processing; Farmed Salmon and Trout Handling and Processing; Farmed Blue Mussel Handling and Processing; Sea Scallop Handling and Processing; Oyster Handling and Processing; Secondary Processing

Duration - 13 weeks

Lectures - 2 hours per week = 26 total hours

Laboratories - 2 hours once per week = 26 total hours

AQUA 4102 (Shellfish Culture)

This course is designed to provide an overview of shellfish culture including mollusk, echinoderm, and crustacean culture techniques.

The Status Quo; Mussel Culture; Oyster Culture; Scallop Culture; Culture of Other Mollusca and Echinoderms (Calm, Abalone and Sea Urchin Culture to be examined); Crayfish Culture; Freshwater Prawn Culture; Shrimp Culture; Lobster Culture; Culture of Other Crustaceans; Seaweed Culture; Future Considerations

Duration - 13 weeks

Lectures - 3 hours per week = 39 total hours

Laboratories - 3 hours per week = 39 total hours

AQUA 4103 (Fish Health)

This course is designed to provide an understanding of the epidemiology, pathology, diagnosis and treatment of major diseases affecting cultured species (primarily fish). The laboratory component will address various diagnostic and applied techniques essential to fish and shellfish health management.

Introduction to the Disease Process; Anatomy and Physiology; Stress and the Disease Process; Immunity; Viral Diseases; Bacterial Diseases; Fungal Diseases; Parasitic Diseases; Non-Infectious Diseases; Disease Control; Legislation; Epidemiology

Lectures - 26 hours (2 hours per week)

Laboratories - 39 hours (3 hours per week)

AQUA 4104 (Fish Nutrition)

This course is designed to provide and understanding of nutrient requirements and feed practices for fish.

Introduction to Fish Nutrition Studies; Feeding Habits and Adaptations; Nutrient Requirements; Diet Formulation; Larval Feeds; Food Requirements; Feeding Practices; Natural Foods in Extensive Culture; Growth and Feeding; Current Developments

Duration - 13 weeks

Lectures/Laboratories - 3 per week
selecting a suitable aquaculture site, including land-based and industrial market. This course has been developed in accordance with the Transport Canada Marine Safety TP 14692 E.

Introduction; Terminology; Vessel Hull Types and Configurations; Seamanship; Collision Avoidance Regulations; Stability; Safety on the Job; Marine Weather; Navigation, Positioning Equipment and Installations; Power Boat Operations; Search and Rescue (SAR) Resources; Protection of the Marine Environment; Departure Preparation; Quick Reference Checklists

Duration - 28 hours

(Practical Aquaculture, Part II - AQUA 4110 (Aquaculture Cage Design and Maintenance)

This is an introductory course outlining floating net cages as containment systems for finfish.

Introduction to Cage Aquaculture: Cage Type and Design; Cage Collars; Flotation; Net Bags; Mooring of Cages; Predator Devices; Cage Maintenance and Cleaning; Commercially Produced Aquaculture Cages; Care, Maintenance and Use of Ropes; Net Mending and Patching; Cage Construction Project; Flume Tank Observation of Model Cage

Duration - 35 hours

(Practical Aquaculture, Part III - SFTY 1101-First Aid

This is the St. John Ambulance standard first aid course which has been created to satisfy the needs of the general business and industrial market.

Compulsory Modules; Elective Modules

Duration - 3 days

AQUA 4107 (Finfish Culture)

This course is designed to provide an overview of finfish culture including husbandry practices and culture technology for salmonids, marine species and warm water fish.

Aquaculture: An Overview; Water Requirements; Salmonids; Marine Species; Warmwater Species

Duration - 13 weeks

Lectures or Laboratories - 3 hours once per week AND 2 hours once per week = 65 hours total

AQUA 4108 (Site Selection)

This course is designed to provide an overview of the criteria for selecting a suitable aquaculture site, including land-based and open-water sites for finfish and shellfish species.

Water Requirements; Technical Site Studies; Finfish and Shellfish Farm Planning

Duration - 65 hours total

AQUA 4109 (Aquaculture Seminar Series II)

This course will present selected topics of relevance to the development of the aquaculture industry.

Cot Farming: Rainbow Trout; Salmon Farming; Other Marine Fish; Eel; Fish Food Production; Mussel Culture; Scallop Culture; Other Shellfish; Provincial Government (Aquaculture Mandate); Federal Government (Aquaculture Mandate); The Role of Aquaculture Associations; Student, Faculty, Visiting Lecturer Presentations

Duration - 13 weeks (1.5 hours per week)

AQUA 4111 (Aquaculture and the Environment)

This course is designed to provide an overview and understanding of current issues related to aquaculture and the environment.

Introduction to Sustainable Aquaculture Environmental Issues; Population and Fisheries Interactions; Physical Impacts of Aquaculture Facilities; Therapeutics and Fish Farming; Benthic and Water Column Impacts; Fish Meal Supply, Contaminants and Food Safety; Beneficial Impacts; Integrated Fish Farming; Environmental Management Practices; Responsible Aquaculture

Duration - 13 weeks

Laboratories - 3 hours per week = 39 total hours

AQUA 4112 (Practical Facility Maintenance and Animal Husbandry)

A practical course to introduce students to recirculating facility maintenance and management, and salmonid animal husbandry (from broodstock maintenance through fry rearing).

Marine Institute (MI) Aquaculture Facility; Activities and Maintenance; Essential Calculations; Animal Husbandry

Duration - 52 hours

Laboratory - 4 hours/week for 13 weeks

AQUA 4113 (Aquaculture Engineering)

This course is designed to provide students with an understanding of engineering principles as they apply to aquaculture technology.

Properties of Water; Water Supply; Mechanics of Fluids; Water Level and Flow Measurement; Pumps; System Construction Materials; Pond Systems; Effluent and Filtration; Recirculation Systems; Disinfection; Aeration; Degassing; Heating and Cooling; Cage Systems; Flume Tank; Observations of Model Cage

Duration - 13 weeks

Laboratories - 4 hours per week = 52 total hours

Laboratories - 2 hours every second week = 12 total hours

AQUA 4114 (Ropework and Net Mending)

This course is designed to develop the participant’s ability to understand the design and construction of various types of rope, maintenance and inspection of ropes, and regulations governing rope usage. It will include rope safety, rope use and maintenance for small vessels, and moorings and anchoring. It will also enable them to perform basic aquaculture net mending tasks.

Ropes; Knots, Bends and Hitches; Ropework/Working with Ropes; Rope Safety; Net Mending and Patching

Duration - 35 hours

AQUA 415A/415B

This course is designed to provide an overview of the criteria for selecting a suitable aquaculture site, including land-based and open-water sites for finfish and shellfish species. Students will also be introduced to the application of mapping and GIS in aquaculture site selection. This course is taught with special reference to finfish and shellfish farm developments and opportunities in Newfoundland, elsewhere in Canada and in other regions of the world.

Water Requirements; Technical Site Studies; Finfish and Shellfish Farm Planning; Mapping and Geographic Information Systems (GIS)

Prerequisite - AQUA 415A - None

AQUA 415A

Duration - 415A - 13 weeks

Lectures/Field Work - One 2-hour session per week = 26 total hours

GIS Laboratories - 1 hour per week = 13 total hours

Duration - AQUA 415A - 13 weeks

Lectures/Field Work - One 2-hour session per week = 26 total hours

GIS Laboratories - 1 hour per week = 13 total hours

BIOL 1100

An introductory level course designed to provide knowledge of plant and animal biology, and their relationships on foods.

The Chemical and Cellular Basis of Life; The Biology of Organisms; The Perpetuation of Life; Biology of Population and Communities; Diversity of Organisms

Duration - 13 weeks

Lectures - 3 hours per week = 39 total hours

Laboratories - 2 hours once per week - 26 total hours

BIOL 2100 (Aquatic Ecology)

This is a second level course designed to cover in moderate detail various aspects of aquatic ecology with emphasis on marine ecology. A strong emphasis will be placed on the laboratory sessions which will introduce students to the kinds of data collected during ecological studies in aquatic environments.

Ecology and Ecosystems; Primary Production and Feeding Relationships; Population Ecology; Ecological Cycles; Aquaculture Ecology

Prerequisite - BIOL 1100 (Biology); STAT 2108 (Applied Statistics)

Duration - 13 weeks

Lectures - 2 hours per week = 26 total hours

Laboratories - 3 hours once per week = 39 total hours

BIOL 2102 (Microbiology)

This course is designed to prepare students for the Food Safety 2101 and Biology 2202 courses.

Introduction to Microbiology; History of Microbiology; Microscopy and Staining; Prokaryotic Microorganisms; Microbial Growth; Viruses; Fungi; Protozoa; Algae; Microbial Genetics; Classification of Prokaryotic Microorganisms; Control of Microbial Growth; Interaction of Microbes and Host; Aquatic Microbiology

Prerequisite - BIOL 1100 (Biology)

Lectures - 39 hours

Laboratories - 39 hours

BIOL 2105 (Microbiology)

This is an introductory level course designed to provide students with an awareness and competency in basic microbiological techniques and applications.

Introduction to Microbiology; Microscopy and Staining; Prokaryotic Microorganisms; Eukaryotic Microorganisms; Viruses; Microbial Growth; Control of Microbial Growth; Drinking Water and Wastewater Treatment; Biogeochemical Cycles

Prerequisite - BIOL 1100 (Biology)

Duration - 13 weeks

Lectures - 39 hours

Laboratories - 39 hours

BIOL 2201 (Microbiology)

This is an introductory level course designed to prepare the students for courses in marine environmental technology.

Introduction to Microbiology; Microscopy and Staining; Prokaryotic Microorganisms; Eukaryotic Microorganisms; Viruses; Microbial Growth; Control of Microbial Growth; Marine Environment and Microorganisms; Microbial Ecology of the Oceans; Marine Microbes and Human Society; Drinking Water and Wastewater Treatment

Prerequisite - BIOL 1100 (Biology)

Duration - 13 weeks

Lectures - 3 hours/week

Laboratories - 3 hours/week

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**COURSE DESCRIPTIONS**

**BIOL 2202 (Food Microbiology)**
This course will introduce students to the microorganisms and their activities in food production.
- **Introduction to Food Microbiology:** Characteristics of Microorganisms Associated with Foods; Factors Influencing Microbial Growth in Foods; Food Spoilage; Food Preservation Methods; Foodborne Diseases; Microbiological Analysis of Foods; Shelf-life and Challenge Studies; Beneficial Uses of Microorganisms in Foods.
- **Prerequisite:** BIOL 2102 (Microbiology) or BIOL 2105 (Microbiology)
- **Lectures:** 39 hours
- **Laboratories:** 39 hours

**BIOL 2300 (Fish Identification and Remediation)**
This is an intermediate level course that develops the student’s understanding of the types of fish that inhabit marine and freshwater habitats of North America. The focus of the course is identification of species, habitat and habitat protection and general fish health.
- **Fish Characteristics and Classification:** Fish Habitats; Fish Identification; Fish Health; Fish Habitat Regulations.
- **Prerequisite:** BIOL 1100 (Biology)
- **Duration:** 70 hours
- **Lecture:** 35 hours
- **Laboratory:** 35 hours

**BIOL 3100 (Marine Biology)**
This is an intermediate level course which develops the student’s understanding of the types of living organisms which inhabit the ocean, tidal, and near shore areas. The interaction of the different species is emphasized throughout the course.
- **Marine Organisms:** Function and Environment; Organisms of the Sea Bed; Organism of the Open Sea; Seaweeds and Benthic Microorganisms; Taxonomic Classification and Adaptations.
- **Prerequisite:** BIOL 1100 (Biology)
- **Duration:** 13 weeks
- **Lectures:** 3 hours/week = 39 total hours
- **Laboratories:** 2 hours once per week = 26 total hours

**BIOL 4104 (Food Microbiology)**
The purpose of this course is to introduce the student to the microbiology of foods. The important parameters controlling microbial growth in foods, the microorganisms involved in spoilage of foods and principles of microbial spoilage and their control will be discussed. Students will also be introduced to the methods of microbiological analysis of foods.
- **Introduction:** Characteristics of Microorganisms Associated with Foods; Sources of Microorganisms in Foods; Factors Influencing Microbial Growth in Foods; Food Spoilage; Food Preservation Methods; Microbial Analysis of Food and Food Environment; Beneficial Uses of Microorganisms in Foods; Shelf-life and Challenge Studies
- **Duration:** 13 weeks
- **Lectures:** 39 hours total
- **Laboratories:** 39 hours total

**BIOL 4105 (Water and Wastewater Microbiological Analysis)**
This course is designed to provide an overview of microorganisms related to water and wastewater and the techniques for monitoring the microbiological safety and quality of water.
- **Introduction to Microbiology:** Microscopy and Staining; Prokaryotic Microorganisms; Microbial Growth; Viruses; Fungi; Protozoa; Algae; Helminthes; Control of Microbial Growth; Antimicrobial Agents; Bacterial Classification; Microbiological Examination of Water; Drinking Water Guidelines; Microbial Indicators of Pollution; Biofilms.
- **Duration:** 13 weeks
- **Lectures:** 3 hours per week = 39 total hours
- **Laboratories:** 3 hours once per week = 39 total hours

**BIOL 4200 (Water and Wastewater Microbiology)**
This course is designed to provide students with an overview of the microbiology of water and wastewater treatment processes.
- **Water and Wastewater Treatment:** Activated Sludge Process; Bulking and Foaming in Activated Sludge Plants; Biofilms and Attached Microbial Growth; Waste Stabilization Ponds; Sludge Microbiology; Anaerobic Digestion of Wastewater and Sludge; Biological Aerobics and Biosolids from Wastewater Treatment Plants; Public Health Aspects of Wastewater and Biosolids.
- **Disposal:** Wastewater Systems Effluent Regulations; Water and Wastewater Disinfection; Microbiological Aspects of Drinking Water Distribution; Drinking Water Guidelines; Methods of Isolation and Identification of Microorganisms; Waterborne Pathogens and Parasites; Biotechnology and Pollution Control.
- **Prerequisite:** BIOL 4105 (Water and Wastewater Microbiological Analysis)
- **Duration:** 13 weeks
- **Lectures:** 2 hours per week = 26 total hours
- **BSMG 0001 (Managing Your Fishing Enterprise)**
This course introduces the participants to the fundamentals of managing a fishing enterprise.
- **The Value of the Newfoundland and Labrador Fishing Industry:** The Participants in the Fishing Industry; The Future of the Fishery; Introduction to Business Management; Analyzing Your Fishing Business; Increasing Profits; Developing Your Business Plan; Record Keeping; Taxes.
- **Duration:** 10 days

**BSMG 0002 (Introduction to Fishing Enterprise Management)**
This course introduces the participants to the fundamentals of managing a fishing enterprise.
- **Introduction to Business Management:** Forms of Business; Analyzing Your Fishing Business; Increasing Profits; Developing Your Business Plan; Record Keeping; Taxes.
- **Duration:** 5 days (35 hours)

**BSMG 0202 (Workplace Preparation)**
This course will provide work term and workplace preparation through an overview of employer expectations, an awareness of individual differences and rights, and an appreciation for maritime careers.
- **Seafaring:** Teamwork; Life at Sea; Personal Management; Interpersonal Communication; Codes, Practices and Regulations; Labour Unions; Substance Abuse; Career Preparation, Professionalism and Ethics; Cultural Diversity and Sensitivity.
- **Prerequisite:** MREQ 0101 (Marine Engineering Knowledge)
- **Duration:** 13 weeks
- **Lectures:** 2 hours/week

**BSMG 0300 (Business Skills)**
This course is designed to introduce the student to the field of entrepreneurship, including the characteristics of the entrepreneur, the advantages and disadvantages of self-employment, and some of the steps involved in starting a business. It will also focus on the role of providing quality customer service. Students will be able to use the skills and knowledge gained in this course to effectively provide a consistently high level of service to the customer.
- **Self-Employment:** Business Ownership; The Entrepreneur; Identifying Business Opportunities; The Entrepreneurial Process; Business and Government Interaction; Service Quality; Customer Wants and Needs; Effective Customer Communication.
- **Prerequisite:** Successful completion of all courses in Terms 1 and Term 2.
- **Duration:** 5 weeks
- **Lectures:** 7 hours/week = 35 hours total

**BSMG 110 (Law and Environment)**
This is the first of two advanced level courses designed to bring together the major elements of the law and the marine environment such that the student might understand the importance of both in their lives as professional seafarers and the intimate connection between the two.
- **The Law and its Purposes:** Marine Insurance; Salvage
- **Prerequisites:** WCTM 1102 (Sea Phase I - Nautical Science)
- **Duration:** 13 weeks
- **Lectures:** 3 hours/week

**BSMG 2209 (Product Development)**
This course is designed to provide the knowledge and skills necessary to conduct the development of a new product. It focuses on the steps required to develop, process and package a food product.
- **Introduction to Marketing Concepts:** Product Planning; Product Development for the Food Industry; Phases in Product Development; Food Science and Technology; Packaging in the Food Industry.
- **Duration:** 13 weeks
- **Lectures:** 3 hours per week = 39 hours

**BSMG 3101 (Engineering Economics)**
This course covers the basic principles of engineering economy with application to engineering economic decision making. The various methods for economic analysis of alternatives are investigated as well as depreciation methods and income tax consequences.
- **Basic Concepts of Engineering Economy:** Economic Decision Making; Analysis of Multiple Alternatives; Depreciation and Income Tax Calculations
- **Prerequisite:** MATH 1100 (Pre-Calculus)
- **Duration:** 12 weeks
BSMG 3105 (Shipyard Management)
This is an advanced level course designed to introduce students in the Naval Architecture and Marine Engineering Systems Design programs to the framework and structure of Canadian shipbuilding.
Prerequisite - ENSG 3301 (Ship Engineering Project) or NARC 3102 (Ship Design)
Duration - 6 weeks
Lectures - 6 hours per week = 36 hours total

BSMG 3109 (Marine Law/Ethics & Environmental Stewardship)
This course involves complex environmental issues, marine law and professional ethics as related to the responsibilities of the Maritime Engineer employed in Canada's Merchant Marine Industry.
Human Relations; Contemporary Issues; Marine Environment; Marine Environmental Science; Marine Environmental Issues; Pollutants; Preventative Remedies; Response Remedies; Industrial Safety; Ship Management; Canada Shipping Act; Regulations
Duration - 5 weeks
Lectures - 6 hours/week = 40 hours total

BSMG 3111 (Environmental Assessment & Auditing)
This is an advanced level course which deals with the assessment and auditing processes as they pertain to the environmental sector.
Environmental Assessment; Project Analysis; Environmental Auditing; and Environmental Auditing Projects
Prerequisite - BSMG 2104 (Policy & Law)
Duration - 13 weeks
Lectures - 3 hours/week

BSMG 3113 (Personnel Resource Management)
This course will provide students with business and organization management knowledge as it pertains to the marine sector.
Seafaring; Marine Terminology; Human Resources; Marine Engineering Diploma Program Requirements; Personnel Resource Management; Employee Relations; National and International Regulations; International Safety Management Code (ISM); Maritime English
Duration - 13 weeks
Lectures - 3 hours/week

BSMG 3114 (Business of Shipping)
This is an advanced level course designed to build on previous knowledge regarding ships and the business of shipping obtained in earlier introductory courses. It is meant to give the student an in-depth knowledge of the organization of shipping, shipping operations, and the cargo market. Its focus is the business of shipping.
The course is designed to help the ship's officer understand the evolution of the shipping industry; the production of shipping services; the types and organization of shipping operations; the cargo market and its organization; and port operations.
An Overview of International Trade and Transport; The Freight Market; Supply, Demand, and Shipping Market Cycles; Shipping Costs and Revenue; and The International Environment of Trade and Transport
Prerequisites - NASC 3102 (Cargo Operations); WKT1 2102 (Sea Phase II - Nautical Science)
Duration - 13 weeks
Lectures - 3 hours/week

BSMG 3115 (Law and Environment)
This is the second advanced level course designed to bring together the major elements of marine law and the marine environment such that the student might understand the importance of both in their lives as professional seafarers and the intimate connection between the two.
The Carriage of Goods by Sea; The Environment and the Law; The Ship’s Master and the Law
Prerequisite - BSMG 2110 (Law & Environment)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

BSMG 3116 (Ship Management)
This is an advanced level course in shipboard management practices designed for future practicing ship’s officers and will lead to an understanding of management practices at sea. It builds on previous knowledge derived from other courses and exposure to actual practice at sea. It is meant to give the student insight into global shipboard management practices and the role they will play as shipboard managers.
Management Issues in Marine Transportation; Basic Principles of Management; The International Safety Management Code (ISM); The International Labour Organization (ILO); The International Transport Federation (ITF); Ship Management and the Master; and Code of Professional Conduct; The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1995 (STCW ’95) with 2010 Amendments
Prerequisites - WKT1 2102 (Sea Phase I - Nautical Science); Safety - 13 weeks
Lectures - 3 hours/week

BSMG 3117 (Food Law)
An introductory course designed to provide an overview of the provincial and federal food agencies and regulations that exists in Canada.
Introduction to Food Law; Canadian Legal System; Canadian Food Inspection Agency; Health Canada; Food and Drugs Act; Food Labelling Regulations; Food Recall; Provincial Legislation; International Food Organizations
Lecture - 39 hours

BSMG 3118 (Technical Problem Solving)
This course is designed to provide the methods and techniques to analyze and solve technical problems that arise in the food industry. It will foster a creative and critical thinking approach in solving day-to-day problems that occur in management, employee, materials, and processing aspects of the food industry.
Creative Thinking; Critical Thinking; Problem Solving
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total

BSMG 3119 (Management Principles)
This course is designed to give participants an understanding of the current business management principles and practices applicable to Canadian industry in general. This course will teach participants to develop organizational decision-making and planning skills and assist them to function as a team player in the modern workplace.
Business and Economic Systems; The Canadian Business System; Small Business and Entrepreneurship; The Business Environment; Functions; Improving Productivity; Practicing Interpersonal Skills; Leadership Skills; Problem-Solving; Making Decisions and Taking Action; Contemporary Management Issues
Duration - 39 total hours
Lectures - 3 hours/week = 39 hours total

BSMG 3120 (Product Development)
This course is designed to provide the knowledge and skills necessary to conduct the development of a new product and focuses on the steps needed to develop, process and package a food product.
Introduction to Marketing Concepts; Product Planning; The Conceptual Process of Product Development; Product Mix; Product Development for the Food Industry; Phases in Product Development; Food Science and Technology; Packaging in the Food Industry
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total

BSMG 3121 (Environmental Economics)
This course covers introductory economic theory with application to the utilization and valuation of natural resources and environmental projects.
Introduction to Economics; Basic Economic Methods and Tools; Economic Systems and Their Roles in Society; The Organization of Business in Canada; Market Forces and Price Determination; Market Forces and Elasticity; Consumer Behaviour; Economic Indicators; Economic Policy; The Economy and the Environment; Analytical Tools in Benefits and Costs; Environmental Analysis; Benefit-Cost Analysis
Prerequisite - None
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours

BSMG 3122 (Law and Environment)
The purpose of this course is to provide the student with knowledge about and opportunities for practical use of various IMO and Transport Canada conventions and regulations related to the law of the sea and protection of the marine environment.
Introduction to Maritime Law; Law of the Sea; IMO Conventions on Safety of Life at Sea and Protection of the Marine Environment; Anti-Pollution Procedures and All Associated Equipment; Pollution-prevention Requirements
Duration - 13 weeks
Lectures - 4 hours per week = 52 hours total

BSMG 3200 (Introduction to Business)
This course is designed to give participants an understanding of current business practices.
Business in a Changing World; Starting and Growing a Business; Managing for Quality and Competitiveness; Creating the Human Resource Advantage; Marketing; Developing Relationships; Financing the Enterprise
Duration - 3 hours/week = 39 hours total

BSMG 3204 (Ship Management)
This is an advanced course in shipboard management practices. It builds on previous knowledge and addresses such advanced topics as Port State Control and Management Practices in the multilingual environment commonly found aboard ships at sea. The course is designed to give students an advanced understanding of ship control and inspection under port state principles, ship management in today’s personnel environment, crisis management and managing in other adverse situations.
Port State Control; Managing in the Multi-Ethnic Environment; Managing Under Adverse Conditions and the Provision of Care; Port State Control; Managing in the Multi-Ethnic Environment; Market Forces and Elasticity; Consumer Behaviour; Economic Indicators; Economic Policy; The Economy and the Environment; Analytical Tools in Benefits and Costs; Environmental Analysis; Benefit-Cost Analysis
Prerequisites - BSMG 3116 (Ship Management); WKT1 2102 (Sea Phase II - Nautical Science)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
BSMG 3205 (Ship Management)
The purpose of this course is to introduce the student to generic management principles and techniques used to manage shipboard personnel. The course also provides the student with knowledge and practical opportunities to use various Transport Canada regulations related to shipboard management.

Basic Principles of Management; Shipboard Personnel Management; Canada Shipping Act, 2001 (CSA 2001); Canada Labour Code (CLC); Canadian Regulations and Vessel Documentation
Prerequisites - NASC 1204 (Seamanship II); WWKT 2102 (Sea Phase II)
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours total

BSMG 3300 (General Ship Knowledge Refresher)
The purpose of this course is to provide the student with knowledge and opportunities for practical use of various IMO and Transport Canada conventions and regulations.

Pollution-Prevention Requirements; International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1995 (STCW 95); Canada Shipping Act, 2001 (CSA 2001); Canadian Regulations and Vessel Documentation; Knowledge of Personal Management; Canada Labour Code
Prerequisites - BSMG 3104 (Ship Management); BSMG 3116 (Ship Management)
Duration - 20 hours over 7 weeks
Lectures - 15 hours over 7 weeks
Laboratories - 5 hours over 7 weeks

BSMG 3400 (Leadership & Teamwork)
This course is intended to provide the student with the knowledge, skill and understanding of leadership and teamwork at the operational level on board a ship. The course is designed to meet STCW requirements for the application of leadership and team working skills, in accordance with the 2010 Manila Amendments of STCW, specifically as stated in tables A-II, A-11/1 and A-11/6. Function: Controlling the operation of the ship and care for persons on board at the operational level.
Shipboard Personnel Management and Training; International Maritime Conventions, Recommendations and National Legislation; Task and Workload Management; Effective Resource Management; Decision Making Techniques; Application of engine Room Resource Management (ERM) Principles
Prerequisites - None
Duration - 27 hours
Lectures - 21 hours
Simulation - 6 hours

BSMG 3401 (Marine Law and Environment Stewardship)
This course addresses complex international and national environmental issues, marine law and professional ethics as related to the responsibilities of the Marine Engineer employed in the global merchant marine service.

Maritime Legislation Originators; International Conventions and Legislation; Anti-pollution/Safety Procedures and Plans; Maritime Law; Canadian Marine Environmental Issues; Pollution Response Remedies; Ship Management; Canada Shipping Act; Canadian Maritime Acts and Regulations
Prerequisites - None
Duration - 13 weeks
Lectures - 5 hours per week = 65 hours total

BSMG 3500 (Fundamentals of Canadian Food Laws and Regulations)
This course is designed to introduce the major topics in Canadian food laws and regulations that are fundamental in the manufacturing and trade of safe and compliant food commodities. While Canadian food laws and regulations are the primary focus of this course, some international food laws and regulations will also be introduced.
Introduction to Canadian Legal System; Canadian Food Inspection Agency (CFIA); Federal Food Acts and Regulations; Additional Federal Departments and Agencies; Provincial Food Laws and Regulations; International Food Laws and Regulations; Genetically Engineered (GE) Food
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total

BSMG 4102 (Marketing Aquaculture Products)
This course is designed to teach participants the fundamentals of marketing. Emphasis is on the components of marketing as they relate to the fishing industry.
Marketing Concepts; The Marketing System and the Environment; Markets and Buyer Behaviour; Market Research Process; Target Markets and Market Segmentation; Product Planning; Product Strategy; New Product Development; Brands, Packaging and Labelling; Price Determination; Fish Farms and Distribution; Promotion
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total

BSMG 4103 (Fundamentals of Food Law)
Knowledge of food legislation is essential in order to control the safety and quality of foods. This course is designed to address the issues and facts that are important for understanding the system of food regulations that exists in Canada.
Introduction to Food Law; Canadian Legal System; Canadian Food Inspection Agency: Health Canada; Food and Drugs Act; Food Labelling Regulations; Food Recalls; Provincial Legislation; International Food Organizations
Duration - 39 hours total

BSMG 4104 (Business Management)
This course is designed to provide an understanding of the current management principles and practices applicable to industry. The course will include the development of a business plan.

Types of Business Organization; Business Description; Management Principles; Productivity and Quality Control; Starting a Business: Sources and Applications of Funding; Financial Reporting: Internal Control and Cash; Financial Statements: Comparative Analysis of Financial Statements; Financial Planning and Budgeting; Business Plan Development; Government Regulation, Taxation and Assistance
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total

BSMG 4106 (Legal Aspects of Coastal Zone Management)
This course provides a general overview of the legal issues related to the administration of the marine environment. It will review the historical process involved in the making of the new Law of the Sea to regulate the use of the oceans and coastal zones. This course will also discuss some of the principles guiding national interests in their territorial waters and their relationship to the management of the coastal zones.
Historical Background of Ocean Management; National Expansion of the Marine Territory; The Search for International Agreements; The UN Conference on the Law of the Sea; National Legislation; New Fishing Laws and changes in Property Rights; Environment Protection Laws; The Legal Framework of Coastal Zone Management
Duration - 13 weeks
Lectures - 3 hours/week

BSMG 4107 (Conflict Resolution Skills)
This course provides participants with an understanding of the basic principles of conflict resolution and negotiation strategies. The skills taught will enable students to accept a role in the coordination of multidisciplinary groups; investigate and solve problems; and generate solutions to inter-sectoral conflicts relevant to the coastal zones.
Introduction to Conflict Resolution; Elements of Effective Leadership; Organizational Behavior; Decision Making and Problem Solving; The Nature of Negotiations; Canadian Labour Practice
Duration - 13 weeks
Lectures - 3 hours/week

BSMG 4109 (Coastal Economics)
This course introduces participants to the economic factors related to the management of Coastal Zones. It will look at the current problems facing these areas and policies in force to regulate and sustain development. Participants should have a general (non-specialist) understanding of the principles of economic science.
The course will make an effort to provide an updated view of the global issues of the Coastal Zone maturation and encourage a critical discussion on the present and future of coastal zone growth.
Introduction to Economics; The Nature of Economics; Economic Systems, Roles, Sectors and Functions; Market Forces and Business Concepts; Price, Utility, Production, and Costs; Natural Resource Economics; Analytical Tools and Environmental Analysis; The Development of Economics and Ecology; Problems and Principles of Ecological Economics; Policies, Institutions and Instruments; Government Management Decision-Making
Duration - 13 weeks
Lectures - 3 hours/week

BSMG 4110 (Environmental Policy-Water Quality)
This course is designed to give students an introduction to the issues surrounding global water management and future expectations for water and wastewater treatment. Environmental law, water guidelines for potable water and wastewater treatment nationally and internationally will be considered.
This course will explore these issues through case studies and seminars.
Resource Status; Resource Characteristics; Resource Regulation; International Efforts and Agreements; Case Studies
Lectures - 39 hours

BSMG 4111 (Fundamentals of Canadian Food Laws and Regulations)
This course is designed to examine the major topics in Canadian food laws and regulations that are fundamental in the manufacturing and trade of safe and compliant food commodities. While Canadian food laws and regulations are the primary focus of this course, pertinent international food laws and regulations will also be introduced.
Introduction to Canadian Legal System; Canadian Food Inspection Agency (CFIA); Federal Food Acts and Regulations; Other Federal Agencies; Provincial Food Laws and Regulations; US Food Laws and Regulations; International Food Laws and Regulations; Genetically Engineered (GE) Food
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours

BSMG 4112 (Management Principles)
This course is designed to give participants an understanding of the current management principles and practices applicable to the industry. This course will concentrate on teaching participants how to develop organizational and planning skills and how to function as a team member.
Introduction to Management and its Evolution; Planning and Strategic Management; Decision Making; Organizational Structure; Leadership Skills; Motivating Employees; Working in Groups and Teams; Foundations of Control; Problem Solving; Adapting to Change; Practicing Interpersonal Skills
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
CHEM 1100 (Chemistry)
This is an introductory course designed to give students a knowledge and understanding of the fundamental chemical concepts which will form the basis for further studies in science and technology. Introduction to Chemistry and Nature of Matter; Atomic Structure; Periodic Table; Chemical Bonding and Nomenclature; Stoichiometry and Chemical Reactions; Intermolecular Forces, Crystal Structure and Alloys.

On Site Sections:
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week
Distance Sections:
Duration - 13 weeks
Lectures - Synchronous/Asynchronous discussion forum available throughout duration of course. Other appropriate instructional methods as required
Laboratories - 13 - 2 hour sessions

CHEM 1101 (General Chemistry I)
This is an introductory chemistry course designed to enable students to gain knowledge and understanding of the fundamental chemical concepts which will form the basis for further studies in science and technology.

Atoms and Elements; Molecules, Compounds, and Chemical Equations; Chemical Quantities and Aqueous Reactions; Periodic Properties of the Elements; Chemical Bonding I: Lewis Theory; Chemical Bonding II: Molecular Shapes

Prerequisite - High school chemistry recommended, but not essential.
Duration (DU) - 13 weeks
Lectures (LC) - 4 hours/week = 52 hours total
Laboratories (LC) - 3 hours once per week = 39 hours total

CHEM 1200 (Chemistry)
This course will develop further the fundamental concepts of chemistry, with emphasis on those relevant to the processes of chemical reaction rates and equilibrium, and electron and proton transfer reactions. These processes will provide the basis for applications in various technologies.

Solutions and Solubility; Rates of Reaction and Chemical Equilibrium; Acids and Bases; Oxidation and Reduction Reactions; Electrochemistry

Prerequisite - CHEM 1100 (Chemistry) or equivalent
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

CHEM 1201 (Chemistry)
This course will develop further the fundamental concepts of chemistry, with emphasis on those relevant to the processes of chemical reaction rates and equilibrium, and electron and proton transfer reactions. These processes will provide the basis for applications in various technologies.

Liquids, Solids, and Intermolecular Forces; Solutions; Chemical Kinetics; Chemical Equilibrium; Acids and Bases; Aqueous Ionic Equilibrium; Electrochemistry

Prerequisite - CHEM 1101 (General Chemistry I)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Problem Solving Tutorial - 1 hour/week = 13 hours total
Laboratories - 3 hours/week = 39 hours total

CHEM 2101 (Environmental Chemistry)
This course is designed to provide students with the basic skills required to perform chemical analysis on environmental samples. The course will build upon knowledge obtained in basic chemistry with applications to the environmental industry.

Basic Environmental Chemistry; Chemistry of Surface and Subsurface Waters; Characteristics of Seawater; Heavy Metals, Metals, Alloys, and Radionuclides in the Environment; Sampling and Chain of Custody

Prerequisite - CHEM 1200 (Chemistry)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

CHEM 2102 (Biological Chemistry)
This is an intermediate level course designed to provide the student with the basics of organic chemistry and how it relates to biologically important substances such as lipids, carbohydrates, and amino acids and proteins.

Introduction to Organic Chemistry; Bonding and Isomerism; Alkanes and Cycloalkanes: Conformational and Geometric Isomerism; Alkenes and Aromatic Compounds; Stereoisomers; Alcohols, Phenols, and Thiols; Ethers; Aldehydes and Ketones; Carboxylic Acids and their Derivatives; Amines and Related Compounds; Amines; Amines, Peptides, and Proteins

Prerequisite - CHEM 1200 (Chemistry)
Lectures - 39 hours
Laboratories - 39 hours

CHEM 2103 (Organic Chemistry)
This is an intermediate level chemistry course designed to provide the student with the basics of organic chemistry.

Introduction to Organic Chemistry; Bonding and Isomerism; Alkanes and Cycloalkanes: Conformational and Geometric Isomerism; Alkenes and Aromatic Compounds; Stereoisomers; Alcohols, Phenols, and Thiols; Ethers; Aldehydes and Ketones; Carboxylic Acids and their Derivatives; Amines and Related Nitrogen Structures

Prerequisite - CHEM 1201 (General Chemistry II)
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total
Laboratories - 3 hours once per week = 39 hours total

CHEM 2201 (Environmental Chemistry I)
This course is designed to provide students with the basic skills required to perform chemical analysis on environmental samples. The course will build upon knowledge obtained in general chemistry with applications to the environmental industry.

Basic Environmental Chemistry; Chemistry of Surface and Subsurface Waters; Characteristics of Seawater; Water and Wastewater Treatment; Organic Toxins and Contaminants

Prerequisite - CHEM 1201 (General Chemistry II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 3 hours/week = 39 hours total

CHEM 2202 (Environmental Chemistry II)
This course is designed to provide students an understanding of the present day concerns in environmental chemistry. It will build upon knowledge obtained in CHEM 2101 (Environmental Chemistry (Term 3))

Water and Wastewater Treatment; Organic Chemistry; Organic Toxins and Contaminants; Toxicology and Epidemiology; Biotic and Abiotic Chemical Transformations

Prerequisites - CHEM 2101 (Environmental Chemistry)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 3 hours/week = 39 hours total

CHEM 2300 (Environmental Chemistry II)
This is an advanced level course designed to provide knowledge in the methods and instrumental equipment used to analyze environmental samples.

Electroanalytical Techniques; Spectroscopic Methods; Separation Methods

Prerequisites - STAT 2108 (Applied Statistics) or equivalent; CHEM 2201 (Environmental Chemistry) or CHEM 2202 (Environmental Chemistry I)
Duration - 13 weeks
Lecture - 3 hours/week = 39 hours total
Laboratories - 3 hours/week = 39 hours total

CHEM 3100 (Food Chemistry)
This course is designed to provide students with a detailed understanding of food analysis and how it relates to food chemistry and food technology.

Introduction to Food Analysis; Spectroscopy; Chromatography; Electrochemistry

Prerequisites - PHYS 1200 (Physics); CHEM 2102 (Biological Chemistry) or CHEM 3102 (Biochemistry)
Lectures - 39 hours
Laboratories - 39 hours

CHEM 3101 (Food Analysis)
This is an advanced level course designed to provide students with a detailed understanding of food analysis and how it relates to food chemistry and food technology.

Introduction to Food Analysis; Spectroscopy; Chromatography; Electrochemistry

Prerequisites - PHYS 1200 (Physics); CHEM 2102 (Biological Chemistry) or CHEM 3102 (Biochemistry)
Lectures - 39 hours
Laboratories - 39 hours

CHEM 3102 (Biochemistry)
This is an intermediate level theory course designed to familiarize the food technology student with the major aspects of biochemistry.

Introduction to Biochemistry; Enzyme Kinetics; Energy Changes and Electron Transfer in Metabolism; Carbohydrate Metabolism; The Citric Acid Cycle; Electron Transport and Oxidative Phosphorylation; Lipid Metabolism; Nitrogen Metabolism

Prerequisites - BIOL 1100 (Biology); CHEM 2103 (Organic Chemistry)
Duration - 39 hours
Lectures - 3 hours/week

CHEM 3200 (Physical Chemistry)
This theory-based course builds upon topics covered in CHEM 1101 (General Chemistry I) and CHEM 1201 (General Chemistry II). Emphasis is on physical concepts and their applications to chemical and biological systems.

States of Matter and Properties of Gases; Thermodynamics: The First Law; Thermodynamics: The Second Law; Phase Equilibria; Properties of Mixtures; Chemical Equilibria

Prerequisites - CHEM 1100 (Chemistry) or CHEM 1101 (General Chemistry I), CHEM 1200 (Chemistry I), CHEM 1201 (General Chemistry II), MATH 1101 (Calculus)
Duration - 13 weeks
Lecture - 3 hours/week = 39 hours total
Problem Solving Tutorial - 1 hour/week = 13 hours total

CHEM 3201 (Industrial Chemistry)
This course will provide an introduction to the composition and analysis of marine fuels and lubricants; the safety precautions required with fuels, lubricants and chemicals during storage, transfer and handling; and outline the damaging effects of corrosion with pipework, equipment and hulls as well as methods to reduce such corrosion.

Fundamentals of Chemistry; Acidic, Neutral, Alkaline Conditions; Corrosion; Salt and Freshwater systems; Fuels and Lubricants; Marine Chemicals; Marine Growth Protection Systems; Ballast Water Management; Safety

Duration - 13 weeks
Lecture - 3 hours/week for a total of 39 hours
Laboratories - 2 hours/week for a total of 26 hours
CHEM 4100 (Water Chemistry)
This course is designed to give the student an understanding of the chemical composition of natural waters and the analytical methods by which these constituents are to be determined.
Criteria and Standards for Drinking Water Quality; Sampling, Quality Assurance/Quality Control; Concentration of Solutions; Characteristics of Natural Waters; Organic Compounds in Raw and Finished Waters; Disinfection Chemistry
Lectures - 39 hours
Laboratories - 39 hours

CHEM 4102 (Food Chemistry)
This is an advanced level course designed to build on knowledge so as to enhance a student’s understanding of food chemistry while introducing a student to chemical concepts related to food safety.
Introduction to Food Chemistry; Reporting Results and Reliability of Analysis; Instrumentation; Naturally Occurring Food Components; Chemical Additives
Lectures - 39 hours total
Laboratory - 39 hours total

CHEM 4200 (Chemical and Analytical Methods)
This is an advanced level course designed to provide the student with a detailed understanding of the instruments and techniques involved in water analysis.
Introduction to Analytical Chemistry; Quality Assurance in Analytical Chemistry; Electroanalytical Techniques; Separation Methods; Quantitative Optical Spectroscopic Methods; Mass Spectroscopy
Lectures - 3 hours per week = 39 total hours
Laboratories - 3 hours once per week = 39 total hours

CMSK 0102 (Communication Skills)
This course is designed to provide students with the various skills needed to communicate more effectively in the workplace.
Learning Strategies; Learning Strategies; Writing Skills I; Technical Reading and Writing; Technical Presentations; Employment Skills I
Duration - 13 weeks
Lectures - 3 hours/week

CMSK 0103 (Communication Skills)
This course is designed to provide vocational students with the various skills needed to communicate more effectively in the workplace.
Learning Strategies; Technical Writing; Oral Reporting; Informal Report Writing; The Job Search; Technical Correspondence
Duration - 10 weeks
Lectures - 4 hours/week for 10 weeks = 40 hours

CMSK 0202 (Communication Skills)
This course is designed to provide students with the various skills needed to communicate more effectively in the workplace.
Employment Skills II; Writing Skills II; Informal Reports; Technical Descriptions; Technical Presentations
Prerequisite - CMSK 0102 (Communication Skills)
Duration - 13 weeks
Lectures - 2 hours/week

CMSK 0203 (Communication Skills)
This course is designed to provide students with the various skills needed to communicate effectively in the workplace.
Specifically, it focuses on interpersonal communication, technical writing, business correspondence, informal reports, and technical presentations.
Interpersonal Communication; Technical Writing; Business Correspondence; Informal Reports; Technical Presentations
Prerequisite - None
Duration - 13 weeks
Lectures - 3/0

CMSK 0300 (Employment Skills)
This course is designed to introduce students to the critical elements of effective job search techniques.
The Labour Market, Job Search Documents, Other Employment-related Correspondence, The Job Interview
Prerequisite - Successful completion of all term two courses
Duration - 5 weeks
Lectures - 3/0

CMSK 1100 (Introduction to Technical Reporting)
This course is designed for students who are interested in learning the fundamentals of technical communication in both oral and written forms. Emphasis is on strategic research, organization, and communication.
Communication Process; Technical Writing Fundamentals; Technical Abstracts; Technical Descriptions; Technical Presentations
Duration - 13 weeks
Lecture - 3 hours/week = 39 hours

CMSK 1102 (Technical Communication I)
This course is designed to provide technology students with the opportunity to develop effective written and oral technical communication skills. Emphasis is on the fundamentals of technical writing, preparing for job searches and writing employment-related documents are also introduced.
Communication Process; Technical Writing Fundamentals; Technical Definitions, Descriptions, and Processes; Technical Presentations; Job Search
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours total

CMSK 1103 (Introduction to Technical Communications and Computer Applications)
This course is designed to teach technology students the fundamentals of technical communication and computer applications. Emphasis is on strategies of technical researching, writing, and presenting.
Introduction; Writing Skills; Software Applications; Technical Writing; Technical Abstracts; Technical Descriptions; Technical Presentations
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

CMSK 1104 (Introduction to Technical Reporting)
The purpose of this course is to provide technology students with the opportunity to develop effective technical reporting skills in both oral and written forms. Emphasis is on the characteristics of technical writing and oral presentation, research gathering and analysis, and the strategies for technical reporting and-presenting.
Duration - 13 weeks
Lectures - 4 hours per week = 52 total hours

CMSK 1105 (Technical Communications II)
This course provides technology students with an opportunity to develop effective written and oral technical communication skills. Emphasis is on the fundamentals of technical writing, preparing for job searches and writing employment-related documents are also introduced.
Communication Process; Technical Writing Fundamentals; Technical Definitions, Descriptions, and Processes; Technical Presentations; Job Search
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours total

CMSK 1200 (Technical Reporting Using Computer Applications)
This course is designed to help technology students apply criteria for structuring informal and formal reports. Various report formats will be examined with emphasis on research, organization, and documentation. Oral reporting techniques will be enhanced through formal technical report and persuasive presentations.
The Strategy of Technical Reporting; Informal Report Writing; Formal Report Writing; Technical Presentations; Technical Military Correspondence; Word Processing Application
Prerequisite - CMSK 1103 (Introduction to Technical Communications and Computer Applications) or equivalent
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

CMSK 1201 (Technical Communications II)
This course is designed to hone technical writing skills, introduce fundamental research skills, develop informal and formal report writing skills, and enhance presentation techniques via a formal report presentation.
Technical Reporting Strategies; Informal Report Writing; Research Fundamentals; Semi-formal/Formal Report Writing; Formal Report Presentations
Prerequisite - CMSK 1102 (Technical Communications I) or CMSK 1105 (Technical Communications II)
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours

CMSK 2101 (Technical Communications III)
This course is designed to help students work well in groups, develop basic strategies for resolving conflict, and interact professionally with the media and the public.
Group Dynamics; Conflict Resolution; Meetings; Media Relations; Ethical Issues/Codes of Ethics
Prerequisite - CMSK 1102 (Technical Communications I); CMSK 1201(Technical Communications II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
COURSE DESCRIPTIONS

CMSK 2102 (Interpersonal Communications)
The food industry operates in a people intensive environment. This course will prepare students to develop and enhance various interpersonal communications skills, positive attitude and self-confidence thorough effective listening, non-verbal perception skills, and information handling. Emphasis will also be given to assertiveness training, conflict resolution and handling difficult behaviour with employees and the public. Presentation skills, team building and group dynamics will form important components of this course. Emphasis in this course will be on practical application, case studies, simulation and role-playing.

Communications as Listening Skills; Information Gathering Methods and Information Management; Assertiveness Training; Oral Presentation Skills; Conflict Resolution and Handling Difficult Behaviour; Developing and Managing Teams; Customer Service
Prerequisite - CMSK 1201 (Communication at Work)
Duration - 8 weeks
Lectures - 5 hours/week

CMSK 2201 (Technical Communications IV)
This course is designed to help students structure and evaluate arguments, develop and organize a position paper for an effective debate, and organize and write a proposal. Argument; Research Documents; Debate Position Paper; Debate; Proposal Writing;
Prerequisite - CMSK 2101 (Technical Communications III)
Duration - 13 weeks
Lectures: 2 hours/week x 26 hours
Seminar: 2 hours/week = 26 hours

CMSK 4102 (Communication Skills)
This course is designed to provide students with effective communications skills and practices to apply in their future workplaces and communities, and with direct application to other advanced diploma program modules. Emphasis will be on presentation skills, meeting management, report and proposal writing, and proficiency in the basic concepts and applications of computer and internet technology as communications tools. Communications Process in Industry and Business; Report and Proposal Writing; Effective Oral Presentation; Group Discussions and Meeting Management Techniques; Business Letters, Office Memos, Electronic Inter-Office Networks; Information Technology Applications; Employment Acquisition Strategies
Prerequisite - Restricted to student in graduate programs
Duration - 39 hours total

CNTL 2102 (Instrumentation, Controls & Automation)
This is an introduction to process instrumentation and control systems, designed to provide the students with the basics of measurement and final control elements.
Introduction to Process Control; Pressure Measurement; Signal Transmission; Level Measurement; Flow Measurement; Temperature Measurement; Final Control Elements
Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week
QR
Duration - 5 weeks
Lectures - 7 hours/week
Laboratories - 4 hours/week

CNTL 2105 (Electro-mechanical Logic)
This course introduces the student to electro-mechanical/ electronic devices used in control systems and to the general concepts and programming techniques associated with programmable logic controllers. Specific training will be provided in the Marine Institute PLC lab.
Electromechanical/Electronic Devices; PLC System Description; Introduction to Digital Systems; Operation of a Programmable Logic Controller; Programming a PLC; The Ladder Diagram; Timers; Counters; Arithmetic Functions; Analog Operations
Prerequisites - CNTL 2102 (Instrumentation, Controls & Automation); ELTR 1101 (Electronics for Instrumentation)
Duration - 13 weeks
Lectures - 3 hours/week x 13 weeks = 39 hours total
Laboratories - 2 hours/week x 11 weeks = 22 hours total

CNTL 2108 (Control Devices and Basic Control Theory)
The course is designed as an introduction to thyristors and basic control theory. It will provide the student with the basic design and operation of Silicon Controlled Rectifiers, common breakover devices, other common thyristors, and the basics of process control.
Silicon Controlled Rectifier; Breakover Devices; Other Thyristors; Transducers and Sensors; Process Control Theory
Co-requisite - ELTK 1102
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

CNTL 2110 (Instrumentation, Controls and Automation)
This is an introduction to process instrumentation and control systems, designed to provide the students with the basics of measurement and final control elements.
Introduction to Process Control; Pressure Measurement; Signal Transmission; Level Measurement; Flow Measurement; Temperature Measurement; Final Control Elements
Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 5 weeks
Lectures - 7 hours/week = 35 hours total
Laboratories - 4 hours/week = 28 hours total

CNTL 2111 (AC Motor Controls)
This is an advanced level course designed to introduce the student to relay control systems, AC motor controllers and variable speed AC motor drives. Upon successful completion, the student should be able to design and analyze typical relay control systems. Also the student should be able to analyze typical motor controllers and variable speed drives used with three-phase alternating current motors.
Relay Control Systems; AC Full Voltage Starters; AC Reduced Voltage Starters; Multi-Speed Controllers; Wound Rotor Motor Controllers; Synchronous Motor Controllers; Alternating Current Drives.
Prerequisites - ELTK 1303 (Electrotechnology)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

CNTL 2202 (Instrumentation, Controls and Automation)
This is an introduction to process control systems, designed to provide the students with the basics of PID Control as well as an overview or more advanced systems.
PID Control; Advanced Control Techniques; Digital Control Systems; Steam Plant Control; Steam Turbine Control; Diesel Plant Control; H.V.A.C. Control; Chiller/Boiler/Distribution System Control.
Prerequisite - CNTL 2102 (Instrumentation, Controls & Automation)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 4 hours/week every second week = 24 hours total

CNTL 2203 (Controls)
This course is intended to show the application of classical control theory to industrial control systems, including Bode Analysis.
Controllers – PLCs
Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 3 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

CNTL 2207 (Programmable Logic Controllers – PLCs)
The course introduces the student to the general concepts of industrial control solutions and programming techniques associated with programmable logic controllers. The student will have the opportunity to apply their abilities and develop troubleshooting skills through practical laboratory sessions on a particular PLC. Currently, specific training can be provided on SIEMENS Simatic S7-300 programmable logic controllers, along with the Step 7 Simatic software.
Introduction to Programmable Controllers (PCs) or Programmable Logic Controllers (PLCs); System Description; The Memory Map; Operation of a Programmable Logic Controller; The Ladder Diagram; Programming a PLC; Timers; Counters; Arithmetic Functions
Prerequisites - ELTK 2102 (Digital Logic); CNTL 2111 (AC Motor Controls)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total
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| **CNTL 2302 (Instrumentation, Controls and Automation)** | This is an introduction to process instrumentation and controls systems, designed to provide the students with the basics of measurement and final control elements and process control. Introduction to Process Control; Pressure Measurement; Signal Transmission; Level Measurement; Flow Measurement; Temperature Measurement; Final Control Elements; PID Control; Advanced Control Techniques; Digital Control Systems<br><br>**Prerequisite** - ELTK 1200 (Electrotechnology)<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours/week = 39 hours total<br><br>**Laboratories** - 2 hours/week = 26 hours total<br><br>**CNTL 3105 (Instrumentation, Controls and Automation)** | This is an introduction to process control systems, designed to provide the students with the basics of PID Control as well as an overview on more advanced systems. PID Control; Advanced Control Techniques; Digital Control Systems; Final Control Elements; Analysis Instrumentation.<br><br>**Prerequisites** - CNTL 2206 (Instrumentation, Controls and Automation)<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours/week = 39 hours total<br><br>**Laboratories** - 4 hours/week x 10 labs = 40 hours total<br><br>**CNTL 3201 (Advanced Programmable Logic Controllers - PLCs)** | This course extends the student's understanding of concepts of industrial control solutions and programming techniques associated with programmable logic controllers, including various hardware and software upgrades. The student will have the opportunity to apply their abilities and develop troubleshooting skills through practical laboratory sessions with a typical programmable logic controller, human machine interface terminal, and variable frequency drive. <br><br>**Program Control;** Bit Manipulation; Sequencers; Analog Operations; PID Control; Human Machine Interface (HMI); and Frequency Drives<br><br>**Prerequisite** - CNTL 2207 (Programmable Logic Controllers – PLCs)<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours per week = 39 hours total<br><br>**Laboratories** - 3 hours once per week for 10 weeks = 30 hours total<br><br>**CNTL 3205 (Marine Process Measurements and Controls)** | This course provides an introduction to shipboard instrumentation and control systems. It is designed to provide the student with the fundamentals of process measurement and control, sensors and measuring instruments, final control devices, and PID controllers.<br><br>**Introduction to Process Control;** Instrument Specifications and Diagrams; Signal Transmission and Indication; Pressure Measurement; Level Measurement; Flow Measurement; Temperature Measurement; Final Control Elements; Introduction to PID Controllers<br><br>**Prerequisites** - ELTK 1202<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours/week = 39 hours total<br><br>**Laboratories** - One 3-hour lab per week for 11 weeks = 33 hours<br><br>**CNTL 3400 (Advanced Controls)** | The purpose of this course is to provide the student with an exposure to advanced control topics and advanced process control systems, with particular attention paid to control topics found in the marine, oil and gas sectors.<br><br>**Smart Transmitters;** Annunciators, Alarms, and Displays; Batch Control; Distillation Controls; Other Advanced Controls.<br><br>**Prerequisites** - CNTL 3105 (Instrumentation, Controls and Automation)<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours per week = 39 hours total<br><br>**Laboratories** - 2 hours once per week = 26 hours total<br><br>**CNTL 3401 (Marine Automatic Control Systems)** | This course introduces automatic control systems and provides students with the basics of PID Control as well as an overview of more advanced process and electro-mechanical control systems used in the marine industry. PID Control; Advanced Process Control Strategies; Marine Processes and Systems; Hierarchical (Computer) Control Systems; Programmable Logic Control (PLC); Electromechanical Control Systems.<br><br>**Prerequisite** - CNTL 3205 (Marine Process Measurements and Controls); ELTR 3123 (Electronic Devices and Digital Systems)<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours/week = 39 hours total<br><br>**Laboratories** - 3 hours/week = 39 hours total<br><br>**CPSK 1100 (Computer Applications)** | This course is designed to introduce students to the use of computers as communication and learning tools.<br><br>**Computer Fundamentals;** Working-processing Software Applications; Electronic Research and Communication; Presentation Software Applications; Spreadsheet Software Applications<br><br>**Prerequisites** - None<br><br>**Duration** - 13 weeks<br><br>**Lectures/Laboratories** - 3 hours/week = 40 hours total<br><br>**CPSK 1101 (Computer Operations)** | This course is designed to introduce the student to the various personal computer operating systems including MS DOS 6.22, Red Hat Linux, and Windows 2000. Introduction to Operating Systems; Introduction to Linux; Introduction to Windows 2000<br><br>**Duration** - 13 weeks<br><br>**Lectures/Lab** - 0/4 hours/week<br><br>**CPSK 1102 (Introduction to Applied Programming)** | This course provides the student with an introduction to the concepts of problem solving using computer programming techniques. The course will be taught using a high level language such as C++ or C#.<br><br>**Computer Fundamentals;** Program Design: C++/C# Fundamentals; Expressions and Interactivity; Decision Statements; Looping Statements; Functions; Arrays; Advanced File Operations; Pointers.<br><br>**Duration** - 13 Weeks<br><br>**Lectures** - 2 hours twice per week = 52 total hours<br><br>**CPSK 1103 (Computer Database and Spreadsheet Applications)** | This course will advance the concept of the computer as a personal productivity tool. Emphasis will be placed on the analysis of spreadsheet data and graphs, understanding of database functions and the integration of software packages with reference to relevant studies.<br><br>**Computer Fundamentals;** Presentation and Word-processing Software Applications; Intermediate and Advanced Spreadsheet Software Applications; Database Software Applications; Software Integration<br><br>**Prerequisite** - None<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 1 hour/week<br><br>**Laboratories** - 4 hours/week (two 2-hour labs/week)<br><br>**CPSK 1300 (Computer Skills)** | This course is designed to introduce students to the use of computers as communication and learning tools.<br><br>**Computer Fundamentals;** Working-processing Software Applications; Presentation Software Applications; Spreadsheet Software Applications

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| **Prerequisite** - None<br><br>**Duration** - 5 weeks<br><br>**Lectures** - 0 hours/week = 0 hours total<br><br>**Laboratories** - 0 hours/week = 0 hours total<br><br>**CPSK 2102 (Intermediate Computer Applications)** | This course will advance the concept of the computer as a personal productivity tool. Emphasis will be on the creation of web pages, analysis of spreadsheet data and graphs, understanding of database functions and the integration of software packages with reference to relevant studies.<br><br>**Web Page Design;** Advanced Spreadsheet Software Applications; Database Software Applications; Software Integration.<br><br>**Prerequisite** - CPSK 1100 (Computer Applications)<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 5 hours/week<br><br>**ELTK 0102 (Electrotechnology)** | This is an introductory course in electrical practice covering the concepts of electricity, circuit analysis, switchboards, wiring and cabling, and navigation lights. Safety Precautions; The Electric Circuit; Ohm's Law and The Power Law; Cells and Batteries; Electrical Measuring Instruments; Conductor Types and Sizes; Switchboards; Wiring Cabling and Distribution; Navigation Lights<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours/week<br><br>**Laboratories** - 2 hours/week (1 Lab every two weeks)<br><br>**ELTK 0200 (Electrotechnology)** | This course further deals with safety in the marine environment, the development of skills required in the use of test equipment, marine electrical maintenance, troubleshooting procedures, paralleling a.c. and d.c. generators, and the maintenance of a.c. and d.c. motors. Safe Workshop Techniques; Magnets and Magnetism; DC Generators; AC Generators; AC Motors; DC Motors; Maintenance Procedures; and Troubleshooting<br><br>**Prerequisite** - ELTK 0102 (Electrotechnology) or equivalent<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 2 hours/week<br><br>**Laboratories** - 2 hours/week (1 Lab every two weeks)<br><br>**ELTK 1100 (Electrotechnology)** | This is an introductory course in electrical theory covering the basic concepts of electricity, circuit analysis and magnetism. The laboratory work is designed to develop skills in the construction of electrical circuits, use of electrical measuring instruments and reinforce theoretical concepts.<br><br>Introduction to Electricity; Ohm's Law and Electric Circuits; Network Theory; Magnetism and Electromagnetism; Electrical Measurement; Inductance; Cells and Batteries<br><br>**Duration** - 13 weeks<br><br>**Lectures** - 3 hours/week = 39 hours total<br><br>**Laboratories** - 2 hours/week = 26 hours total

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**CPSK 1100 (Computer Applications)**<br>**Prerequisite** - None<br>**Duration** - 13 weeks<br>**Lectures** - 3 hours/week = 39 hours total<br>**Laboratories** - 2 hours/week = 26 hours total

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**CPSK 2102 (Intermediate Computer Applications)**<br>**Prerequisite** - CPSK 1100 (Computer Applications)<br>**Duration** - 13 weeks<br>**Lectures** - 5 hours/week

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**ELTK 0102 (Electrotechnology)**<br>**Prerequisite** - None<br>**Duration** - 13 weeks<br>**Lectures** - 3 hours/week

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**ELTK 0200 (Electrotechnology)**<br>**Prerequisite** - ELTK 0102 (Electrotechnology) or equivalent<br>**Duration** - 13 weeks<br>**Lectures** - 2 hours/week

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**ELTK 1100 (Electrotechnology)**<br>**Duration** - 13 weeks<br>**Lectures** - 3 hours/week = 39 hours total<br>**Laboratories** - 2 hours/week = 26 hours total
An introduction to transformers and polyphase A.C. circuits is solve circuits containing resistance, capacitance and inductance. This course covers the basics of A.C. theory and its application to the safe operation of electrical and marine power systems. It covers basic DC and AC machine theory and introduces the student to the safe operation of electrical systems and machines. As well, the structure and protection of marine power systems is covered.

DC Machines; AC Machines; Transformers; Marine Electrical Power Systems

Prerequisite - ELTK 1103 (Introduction to Electrotechnology Applications) OR ELTK 1200 (Electrotechnology)
Duration - 5 weeks
Lectures - 3 hours/week = 40 hours total
Labs - 4 hours/week = 20 hours total
OR
Duration - 13 weeks
Lectures - 2 hours per week = 38 total hours
Laboratories - 2 hours once per week for 10 weeks (starting in week 2) = 20 total hours

ELTK 2012 (Marine Electric Systems)

This is an intermediate course in ships electrical systems.
Ships Electrical Systems (General); Small Ship System; Large Ship System; Electrical Propulsion; Automation

Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 5 hours/week

ELTK 2013 (Electrotechnology)

This is an intermediate level course designed to introduce students to the safe operation of electric systems and machines.
DC Machines; AC Machines; Marine Electrical Power Systems

Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ELTK 2014 (Electrotechnology)

This is an introductory course in ship electrical systems.
Ship Electrical System; Small Ship System; Large Ship System

Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 5 weeks
Lectures - 7 hours/week

ELTK 2106 (Electrotechnology)

This is an introductory course in electrical machine theory. It covers the basics of DC machines and transformers and provides students with a background in electrical machines. It will give students an appreciation of how machines work and an idea of what they are used for. The course will expand students’ knowledge of transformers and their applications, as well as enhance their ability to analyze electrical circuits. The laboratory work is included to reinforce theoretical concepts and to enhance skills in the use of measuring instruments.
DC Machine Construction; DC Generators; DC Motors; Single-phase Transformers; Special Transformers

Prerequisite - ELTK 1200 (Electrotechnology) or equivalent
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ELTK 2017 (Electrotechnology)

This course is an introductory course in electrical machine theory. It covers the basics of A.C. and D.C. machine theory and provides the necessary background for subsequent courses in electrical machines. It also provides the students with an understanding of various types of controls devices for A.C. and D.C. machines.
D.C. Machines; A.C. Machines; Servomechanisms and Servomechanisms; Final Correcting Devices and Amplifiers; Input Transducers - Measuring Devices; Typical Industrial Systems

Prerequisite - ELTK 1201 (Electrotechnology) or ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

ELTK 2018 (Electrotechnology)

This course is an introductory course in electrical machine theory. It covers the basics of A.C. and D.C. machine theory and provides the necessary background for subsequent courses in electrical machines. It also provides the students with an understanding of various types of switches used with A.C. and D.C. machines.
D.C. Machines; A.C. Machines; Mechanical and Electro-mechanical Switches

Prerequisite - ELTK 1201 (Electrotechnology) or ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

ELTK 2111 (Marine Electrical Equipment)

This is a basic electrotechnology course designed to give the Marine Engineering student practical electrical experience.
Marine Safety; Meters and Meggers; Electrical Panels; Control Devices; Protection Equipment; Marine Cabling and Glading; Single and Three-phase Wiring; Distribution Schemes; Earth/Ground Fault Detection Systems; Batteries; Motors and Generators; Internal Communications

Prerequisite - ELTK 1100 (Electrotechnology) or ELTK 1102 (Electrotechnology)
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

ELTK 1301 (Electrotechnology)

This is a basic electrotechnology course designed to give the Marine Engineering student practical electrical experience.

Prerequisite - ELTK 1100 (Electrotechnology) or ELTK 1102 (Electrotechnology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ELTK 1200 (Electrotechnology)

This course covers the basics of A.C. theory and its application to solve circuits containing resistance, capacitance and inductance. An introduction to transformers and polyphase A.C. circuits is also included.

Basic A.C. Theory; Inductance; Capacitance; Parallel and Series A.C. Circuits; Resonance; Introduction to Transformers; Introduction to Polyphase A.C.

Prerequisite - None
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total
Laboratories - 2 hours/week = 26 hours total

ELTK 1203 (Basic Electrical Technology)

This is an introductory course in electrical theory covering the basic concepts of electricity, circuit analysis and magnetism. The laboratory work is designed to develop skills in the construction of electrical circuits, use of electrical measuring instruments and reinforce theoretical concepts.

Introduction to Electricity; Ohm’s Law and Electric Circuits; Network Theory; Magnetism and Electromagnetism; Electrical Measurement; Inductance; Cells and Batteries

Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

ELTK 1302 (Electrotechnology)

This is an introductory course in electrical theory covering the basic concepts of electricity, circuit analysis and magnetism. The laboratory work is designed to develop skills in the construction of electrical circuits, use of electrical measuring instruments and reinforce theoretical concepts.

Introduction to Electricity; Ohm’s Law and Electric Circuits; Network Theory; Magnetism and Electromagnetism; Electrical Measurement; Inductance; Cells and Batteries

Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

ELTK 1303 (Electrical Machines and Power Systems)

This is an intermediate level course in electrical machine theory and marine power systems. It covers basic DC and AC machine theory and introduces the student to the safe operation of electrical systems and machines. As well, the structure and protection of marine power systems is covered.

DC Machines; AC Machines; Transformers; Marine Electrical Power Systems

Prerequisite - ELTK 1103 (Introduction to Electrotechnology Applications) OR ELTK 1200 (Electrotechnology)
Duration - 5 weeks
Lectures - 3 hours/week = 40 hours total
Labs - 4 hours/week = 20 hours total
OR
Duration - 13 weeks
Lectures - 2 hours per week = 38 total hours
Laboratories - 2 hours once per week for 10 weeks (starting in week 2) = 20 total hours

ELTK 1201 (Electrotechnology)

This course is a continuation of the electrotechnology course taken in the first semester. It covers the basics of A.C. Theory and the application of this to solve circuits containing resistance, capacitance and inductance. An introduction to transformers and polyphase A.C. circuits is also included.

Basic A.C. Theory; Inductance; Capacitance; Parallel and Series A.C. Circuits; Resonance; Introduction to Transformers; Introduction to Polyphase A.C.

Prerequisite - ELTK 1101 (Electrotechnology)
Duration - 13 weeks
Lectures - 5 hours/week
Laboratories - 2 hours/week

ELTK 1206 (Electrotechnology)

This is an introductory course in electrical machine theory. It covers the basics of DC machines and transformers and provides students with a background in electrical machines. It will give students an appreciation of how machines work and an idea of what they are used for. The course will expand students’ knowledge of transformers and their applications, as well as enhance their ability to analyze electrical circuits. The laboratory work is included to reinforce theoretical concepts and to enhance skills in the use of measuring instruments.
DC Machine Construction; DC Generators; DC Motors; Single-phase Transformers; Special Transformers

Prerequisite - ELTK 1200 (Electrotechnology) or equivalent
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ELTK 2107 (Electrotechnology)

This course is an introductory course in electrical machine theory. It covers the basics of A.C. and D.C. machine theory and provides the necessary background for subsequent courses in electrical machines. It also provides the students with an understanding of various types of controls devices for A.C. and D.C. machines.
D.C. Machines; A.C. Machines; Servomechanisms and Servomechanisms; Final Correcting Devices and Amplifiers; Input Transducers - Measuring Devices; Typical Industrial Systems

Prerequisite - ELTK 1201 (Electrotechnology) or ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

ELTK 2010 (Electrotechnology)

This course is an introductory course in electrical machine theory. It covers the basics of A.C. and D.C. machine theory and provides the necessary background for subsequent courses in electrical machines. It also provides the students with an understanding of various types of switches used with A.C. and D.C. machines.
D.C. Machines; A.C. Machines; Mechanical and Electro-mechanical Switches

Prerequisite - ELTK 1201 (Electrotechnology) or ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

ELTK 2104 (Electrotechnology)

This is an introductory course in ship electrical systems.
Ship Electrical System; Small Ship System; Large Ship System

Prerequisite - ELTK 1200 (Electrotechnology)
Duration - 5 weeks
Lectures - 7 hours/week
ELTK 2118 (High Voltage Safety) This course is designed to familiarize students with regulations and safety practices related to the operation, maintenance and repair of Remote Operated Vehicles (ROVs). Applicable laws and standards relevant to medium and high voltage safety, as well as, the associated protective equipment required will be addressed. Proper work procedures to be followed when carrying out maintenance and repair of ROVs will be discussed.

Lectures: 2 hours/week Laboratory: 3 hours/week

ELTK 2119 (Marine Electrical Systems) This course gives students knowledge and skills in basic shipboard rotating electrical equipment, auxiliary power distribution systems, electrical fault protection and safe electrical usage.

Lectures: 3 hours/week Laboratory: 13 hours total

ELTK 2200 (Marine Electrical Troubleshooting) This is an electrotechnology course designed to give the ROV student practical experience in electrical troubleshooting. The course requires students to apply structured problem-solving strategies to identify and resolve problems with ROV electrical. This course provides non electrical students to enhance their skills in the use of measuring instruments.

Duration: 13 weeks Lectures: 3 hours/week Laboratory: 2 hours/week

ELTK 2303 (Electro-Maintenance) This is a hands-on Electrotechnology course designed to provide the student with the ability to develop practical skills in shipboard electrical maintenance in DC/AC equipment and electrical system.

Battery Systems and Electrolysics; Electric Motors and Alternators; Marine Electrical Equipment, Wires, Cables and Glands; Function Tests; Starters and Controllers; Electrical Panels

Duration: 5 weeks Lectures: 0 hours/week = 0 hours Laboratory: 8 hours/week = 40 hours total

ELTK 3010 (Electro-Maintenance) This is an advanced level course which covers topics in AC machines. The course is designed to provide the student with the necessary knowledge and skills to understand the characteristics, and applications of AC machines.

Three-phase Transformers; Three-phase Induction Motors; Three-phase Synchronous Motors; Motor Branch Circuit and Enclosures; Alternators; Single-phase Induction Motors

Duration: 13 weeks Lectures: 3 hours/week Laboratory: 2 hours/week

ELTK 3014 (Electro-Maintenance) This course is intended to upgrade non electrical students to enable them to complete subsequent electrical courses in the ROV program.

Review of Basic Electrical Concepts; Ohm's Law and Electric Circuits; Semiconductor OXides Bipolar Junction Transistors; Silicon Controlled Rectifier; Other Thyristors; Operational Amplifier Circuits.

Duration: 3 weeks Lectures: 9 hours/week = 27 hours total Laboratories: 4 hours/week (6 Labs) = 12 hours total

ELTK 3015 (High Voltage Safety) This course is designed to familiarize students with regulations and safety practices related to the operation, maintenance and repair of Remote Operated Vehicles (ROVs). Applicable laws and standards relevant to medium and high voltage safety, as well as, the associated protective equipment required will be addressed. Proper work procedures to be followed when carrying out maintenance and repair of ROVs will be discussed.

Lecture: 3 hours/week Laboratory: 30 hours total

ELTK 3016 (Marine Electrical Troubleshooting) This is an electrotechnology course designed to give the ROV student practical experience in electrical troubleshooting. The course requires students to apply structured problem-solving strategies to identify and resolve problems with ROV electrical.

Duration: 13 weeks Lectures: 3 hours/week = 39 hours total Laboratories: 2 hours/week = 26 hours total

ELTK 3202 (DC Machines and Transformers) This course in electrical machine theory covers the basics of DC machines and transformers, provides the necessary background in electrical machines, gives an appreciation of rotating machinery, and describes the type and operating characteristics of various DC machines. It also addresses transformers and their applications, electric circuit analysis, and includes laboratory work to reinforce theoretical concepts and enhance student skills in the use of measuring instruments.

This course is intended to provide the student with the knowledge and skills to work on deck and subsea installations in a marine environment. It will involve application considerations for construction and selection of materials, terminations, cable types, and marine electrical installations and hazardous area considerations, and sonar, data collection and Remote Operated Vehicle considerations.

Duration: 13 weeks Lectures: 4 hours/week = 52 hours total Laboratories: 1 hour/week = 13 hours

ELTK 3203 (DC Machines and Transformers) This course in electrical machine theory covers the basics of DC machines and transformers, provides the necessary background in electrical machines, gives an appreciation of rotating machinery, and describes the type and operating characteristics of various DC machines. It also addresses transformers and their applications, electric circuit analysis, and includes laboratory work to reinforce theoretical concepts and enhance student skills in the use of measuring instruments.

DC Machines; DC Generators; DC Transformers; Single-Phase Transformers; Three-Phase Transformers; Special Transformers

Duration: 13 weeks Lectures: 7 hours per week = 35 hours total Laboratories: 3 hours twice per week (labs and industrial visits) = 30 hours total

ELTK 3400 (Shipboard Voltage Distribution Systems) This electrotechnology course is designed to give the student basic shipboard electrical knowledge of high and low voltage power distribution systems, electrical fault detection and protection.

Electrical Safety; High Voltage Test Equipment; Shipboard Power Distribution Systems; Electrical Fault Detection; Fault Protection Equipment; Electrical Survey Requirements

Duration: 13 weeks Lectures: 4 hours/week = 52 hours total Laboratories: 1 hour/week = 13 hours

ELTK 3500 (Marine Cabling Installations) This course is intended to provide the student with the knowledge and skills to work to select, install, and terminate cables on deck and subsea installations in a marine environment.
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| **Marine Cable Construction:** Submersed Data collection system and ROV cable considerations; Explosion protection for Electrical/Instrumentation installations (oil and gas); Connectors and Terminations (on deck); Connectors and Terminations (submersed); Splicing and Potting (submersed); Underwater Equipment Terminations (mechanical)

**Prerequisite:** ELTR 2113 (Fiber Optics)
**Duration:** 5 weeks
**Lectures:** 4 hours/week = 20 hours total
**Laboratories:** 4 hours twice a week = 40 hours total

**ELTR 1101 (Electronics for Instrumentation)**
This is an introductory electronics course intended to introduce students to the electronics circuitry used in instrumentation. This course provides the necessary prerequisite electronics for subsequent courses in marine engineering process control and instrumentation.

**Semiconductor Devices:** Integrated Circuits; Transistor Switching Circuits, and Macromodels as Control Devices

**Prerequisite:** ELTK 1100 (Electrotechnology)
**Duration:** 13 weeks
**Lectures:** 3 hours/week = 39 total hours

**ELTR 1102 (Basic Electronic Devices)**
This course will include the description, operation and application of simple electronic components with particular emphasis on semiconductor theory. Analysis techniques involving diode equivalent circuits will be introduced and expanded to bipolar transistor D.C. Biasing.

**Semiconductors; Diode Applications; Bipolar Junction Transistors

**Prerequisite:** for Electro-Mechanical and Electronics Engineering Technician Students: ELTK 1101 (Electrotechnology) for Bachelor of Technology (Ocean Instrumentation) students: ELTK 1200 (Electrotechnology)
**Duration:** 13 weeks
**Lectures:** 3 hours/week = 39 hours total
**Laboratories:** 2 hours/week x 11 weeks = 22 hours total

**ELTR 1103 (Electronic Fabrication Techniques)**
This a practical electrical/electronic course which enables the student to obtain practical knowledge in soldering, wire wrapping, cable formation and test lead fabrication; it also equips the student to insert and extract electronic components from printed circuit boards and make repairs to damaged traces on a PCB. In addition, the student gains knowledge in electrical and hazardous material safety, proper use and care of hand tools, hazards and prevention of ESD and surface mounting components.

**General Workshop:** Safety Procedures; Basic Handtools Used in Electronic Repair and Fabrication; Soldering and Desoldering Techniques; Circuit Wiring Techniques; Cable Formation and Connectors; Schematic Diagrams and Component Identification; Surface Mount Components

**Duration:** 6 weeks
**Lectures:** 1 hour per week = 6 total hours
**Laboratories:** 3 hours twice per week = 36 total hours

**ELTR 1301 (Control Electronics for ROV)**
The course will include the description, operation and application of simple electronic components with particular emphasis on semiconductor theory. Analysis techniques involving diode equivalent circuits will be introduced and expanded to bipolar junction transistors, field-effect transistors and power control devices.

**Semiconductor Diodes; Bipolar Junction Transistors; Field-Effect Transistors; Thyristors

**Prerequisite:** ELTK 1103 (Introduction to Electrotechnology Applications)
**Duration:** 13 weeks
**Lectures:** 3 hours/week = 39 total hours
**Laboratories:** 2 hours/week x 11 weeks = 22 total hours

**ELTR 2102 (Digital Logic)**
This course introduces students to the field of digital electronics. They will be taught design and diagnosis techniques applicable to digital electronics.

**Introduction to Digital Circuits:** Combinatorial Logic; Logic Families; Programmable Logic Arrays; Sequential Logic

**Duration:** 13 weeks
**Lectures:** 3 hours/week
**Laboratories:** 1 @ 2 hours /week

**ELTR 2107 (Electronic Troubleshooting)**
This course requires students to apply structured problem-solving strategies to typical electronics equipment repairs.

**Structured Problem Solving:** Technical Documentation; Power Supplies; Tracing Analog Signals; Audio Frequency Systems; Radio Frequency Systems

**Duration:** 13 weeks
**Lectures:** 2 hours/week
**Laboratories:** 4 hours/week (2 labs @ 2 hours per week)

**ELTR 2110 (Analog Communications)**
This is an intermediate level electronics course designed to provide students with an introduction to the area of analog communications.

**Introduction to Analog Communications:** Modulation and AM Systems; Single-Sideband Techniques; Frequency and Phase Modulation; Matching Circuits; Noise

**Co-requisites:** ELTR 1102 (Basic Electronic Devices); MATH 1003 (Introduction to Calculus)
**Duration:** 13 weeks
**Lectures:** 3 hours/week
**Laboratories:** 1 lab @ 3 hours/week

**ELTR 2113 (Fiber Optics and Network Cabling)**
This fiber optics communications course emphasizes the practical application of fiber to the design and construction of communication systems and networks. The approach will give the student a hands-on, practical understanding of cable handling, terminating, splicing, testing with optical sources, and power meters; as well, the student will learn about twisted pair and coaxial network cabling.

**Introduction to Fiber Optics; Optical Fibers; Optical Fiber Connections and Accessories; Fiber Optic Systems and Components; Fiber Installation; Termination and Testing, Network Cables

**Pre-requisites:** ELTR 1103 (Electronic Fabrication Techniques) OR ELTR 1104 (Electronic Fabrication Techniques)
**Duration:** 13 weeks
**Lectures:** 1 hour/week (13 total hours)
**Laboratories:** 2 hours once/week (26 total hours)
**Duration:** 13 weeks
**Lectures:** 2 hours/week (10 hours total)
**Laboratories:** 3 hour lab twice/week (30 total hours)

**ELTR 2114 (Electromagnetic Radiation)**
This course is designed to give naval students basic knowledge of radiation hazards onboard the Department of National Defense vessels. This course covers solutions to common radiation hazards and standardized tests for radiation hazards on naval vessels.

**Introduction to the Shipboard Electromagnetic Environment; EMI and EM Fields; Shipboard Antennas and Radar; Shipboard EMI Sources; Shields, Enclosures, and Apertures; Cables and Transmission Lines; Grounds and Bonds; Radiation Hazards; EMC Investigations and Testing

**Prerequisite:** ELTK 1101
**Duration:** 13 weeks instruction
**Lectures:** 2 hours/week = 26 total hours
**Laboratories:** 1 hour/week = 13 total hours

**ELTR 2115 (Data Communications)**
This Data Communications course provides a comprehensive data communications background to ROV candidates. The course assists students in an introduction to analog communications providing a background in modulation and frequency modulation principles including single-sideband techniques. Then the student is introduced to transmission mediums, protocols and characteristics. This is followed by digital communications data, transmission and emphasizes the practical application of fiber. This course provides for the design and construction of communication systems and networks required for ROV operations. The approach will give the student the required communications background and a hands-on, practical understanding of cable handling, terminating, splicing, testing with optical sources, and power meters.

**Introduction to Analog Communications; Modulation and AM Systems; Single-Sideband Techniques; Frequency and Phase Modulation; Transmission Mediums and Protocols; Transmission Characteristics; Digital Communications Systems; Data Transfer; Fibre Optics.

**Prerequisite:** ELTK 1103 (Introduction to Electrotechnology Applications) OR ELTR 1200 (Electrotechnology) or equivalent
**Duration:** 13 weeks
**Lectures:** 3 hour per week = 39 total hours
**Laboratories:** 2 hours once per week = 26 total hours

**ELTR 2116 (Industrial Electronics & Controls)**
This course is designed to enable students to design and work with power supplies, electrical motors and their electronic controllers in ROV applications.

**Switched Mode Power Supplies (SMPS); Operational Amplifiers and Applications; Power Electronics; Electronic Controllers for Electrical Drives in ROV

**Pre-requisites:** ELTR 1301 (Control Electronics for ROV); ELTR 1303 (Electrical Machines and Power Systems)
**Duration:** 13 weeks
**Lectures:** 3 hours per week = 39 total hours
**Laboratories:** 2 hours once per week = 26 total hours

**ELTR 2117 (Microcomputer Interfacing I)**
This course provides the student with knowledge of the software and hardware associated with a microprocessor system and its basic interfacing requirements.

**Microprocessor Systems; C++ Language Basics; 8086/88 Microprocessor and Supporting Chips; Memory Systems; Input/Output and Communications; Shielding, Grounding and Transmission Line Techniques; Interfacing Basics and Special Applications (Laboratory Objective)
COURSE DESCRIPTIONS

ELTR 2118 (Introduction to Computers and Networking)
This course is an introduction to computer systems and networking.
Prerequisites - CPSK 1102 (Introduction to Applied Programming); ELTR 2012 (Digital Logic); ELK 1303 (Electrical Machines and Power Systems); ELTR 1103 (Fabrication Techniques)

ELTR 2202 (Analog Transistor Circuits)
This course involves the application of linear circuit theory to transiton circuits. The student will be introduced to linear models of discrete transistors and will learn how to use them to build up Generalized Amplifier modes of complete amplifier systems.
Prerequisites - ELTR 1102 (Basic Electronic Devices) or ELTR 1301 (Introduction to Electronic Devices); ELK 1200 (Electrotechnology) or ELTR 1103 (Introduction to Electrotechnology Applications)

ELTR 2213 (Control Devices and Operational Amplifiers)
This course is designed as an introduction to thyristors and operational amplifiers. It will provide the student with the basic design and operation of Silicon Controlled Rectifiers, common breakover devices, other common thyristors, common operational amplifier circuits used in industrial controls, and the design of active filters.
Silicon Controlled Rectifier, Breakover Devices, Other Thyristors, Operational Amplifier Circuits, Active Filters
Prerequisites - ELTR 1102 (Basic Electronic Devices) Duration - 13 weeks Lectures - 3 hours/week = 39 hours total Laboratories - 2 hours/week = 26 hours total

ELTR 2214 (Microcomputer Interfacing)
This course provides the student with knowledge of the software and hardware associated with a microprocessor system and its basic interfacing requirements.
Microprocessor Systems; Advanced C++; Intel Microprocessors and Supporting Chips; Memory Systems; Input/Output and Communications; Shielding, Grounding and Transmission
Prerequisites - CPSK 1102 (Introduction to Applied Programming); ELTR 2102 (Digital Logic); ELK 1303 (Electrical Machines and Power Systems); and ELTR 1104 (Electronics Fabrication Techniques)

ELTR 22215 (Microcontroller Interfacing)
This course provides the student with knowledge of the Software and hardware associated with a Microcontroller and its basic interfacing Techniques.
Microcontroller Basics; Microcontroller Architecture; Communication Interfaces and Buses; Software Development; Shielding, Grounding and Transmission Line Techniques; Hardware
Prerequisites - CPSK 1102 (Introduction to Applied Programming); ELTR 2102 (Digital Logic); ELK 1303 (Electrical Machines and Power Systems); and ELTR 1104 (Electronics Fabrication Techniques)

ELTR 3100 (Analog Integrated Circuits)
The purpose of this course is to provide the student with an understanding of the theory relating to differential and operational amplifiers, analog filters and signal generators. The theory covered in class will be applied and validated during the laboratory periods.
The Design of an Operational Amplifier; Operational Amplifier Characteristics; Linear Applications; Active Filters; Non-Linear Applications
Prerequisite - ELTR 2202 (Analog Transistor Circuits)
Duration - 13 weeks Lectures - 3 hours/week Laboratories - 1 lab @ 3 hours/week

ELTR 3104 (Digital Signal Processing)
This course introduces the student to digital signal processing concepts.
Introduction to Digital Signal Processing; Signal Analysis; Digital Signal Processing; Digital Filters; Data Compression; Naval Applications of DSP
Prerequisite - MATH 1103 (Introduction to Calculus) or MATH 1101 (Introduction to Calculus)
Duration - 13 weeks Lectures - 3 hours/week Laboratories - 3 hours/week/x 10 weeks

ELTR 3105 (Pulse and Switching Circuits)
This course will expose students to circuits used in pulse and switching applications. Analysis and design of the circuits will be emphasized along with the idea of utilizing such circuits as building blocks to larger scale digital circuits.
Pulse Fundamentals; RC Circuits; Switching Circuits; Active Filtering Circuits (Using Op-Amps); Applications
Prerequisites - ELTR 2108 (Control Devices & Basic Control Theory) or ELTR 2109 (Control Devices); ELK 1101 (Introduction to Calculus)
Co-requisite - ELTR 2202 (Analog Transistor Circuits)
Duration - 13 weeks Lectures - 5 hours/week * 13 weeks Laboratories - 3 hours/week * 10 weeks

ELTR 3108 (Microcomputer Interfacing)
This course provides the student with the knowledge of the hardware associated with a microprocessor system and the interfacing requirements for communication with the environment.
Microprocessor Systems; Memory Systems; Digital Input/Output; Analog Input/Output; Specific Applications; Microprocessor System Support Circuits; Buses; Testing and Troubleshooting
Co-requisite - CPSK 1101 (C-Language Programming) for Electronics Engineering Technician and Electro-Mechanical Technician Students only; ELTR 2102 (Digital Logic)
Duration - 13 weeks Lectures - 6 hours/week Laboratories - 3 hours/week

ELTR 3109 (Introduction to Networks)
This introductory course in local, metropolitan and wide area networks covers the various levels of network protocol, from the lowest hardware levels to the highest application protocols.
Introduction to Networks; Physical Layer; Data Link Layer; Medium Access Control Layer; Network Layer; Transport Layer; Application Layer; Network Security
Prerequisite - ELTR 3108 (Microcomputer Interfacing)
Duration - 13 weeks Lectures - 4 hours/week * = 52 hours total Laboratories - 3 hours/week = 39 hours total

ELTR 3114 (Radar and Sonar Systems)
This is an introductory course in radar and sonar system fundamentals.
Radar: The Radar System; Display System; The Radar Equation; Clutter and Multipath Effects; Processing Techniques; Sonar: Sonar Systems; The Sonar Equation; Underwater Transducers; Transmission Loss in an Ocean Environment; Noise and Reverberation; Sonar Prediction
Prerequisite - ELTR 2110 (Analog Communications)
Duration - 13 weeks Lectures - 3 hours/week = 39 hours total Labs/Tutorials - 2 hours/week = 26 hours total

ELTR 3115 (Electronic Communications - Radar)
An introductory course in radar system fundamentals.
The Radar System; Display Systems; The Radar Equation; Clutter and Multipath Effects; Processing Techniques
Prerequisite - ELTR 2110 (Analog Communications)
Duration - 13 weeks Lectures - 2 hours/week = 26 hours total Labs/Tutorials - 2 hours/week = 26 hours total

ELTR 3116 (Advanced Networking)
This advanced networking course covers the various levels of network protocol, from the lowest hardware levels to the highest application protocols.
Introduction to Networks; Reference Models; Network Operating Systems; Wide Area Networks; Cisco Platforms; Voice Over IP; Network Management; Network Security
Prerequisites - ELTR 3108 (Microcomputer Interfacing); CPSK 1101 (Computer Operations)
Duration - 13 weeks Lectures - 4 hours/week Laboratories - 6 hours/week

ELTR 3117 (Fabrication)
This is a practical electrical/electronic course which enables the student to obtain the practical knowledge in soldering, wire wrapping, cable formation and test lead fabrication. This course also enables the student to obtain the practical ability to insert and extract electronic components from printed circuit boards and well as make repairs to damaged traces on a PCB. In addition, the student receives knowledge in electrical safety, proper use and care of hand tools, proper use and care of equipment, and hazards and prevention of ESD.
General Safety Procedures; Basic Hand Tools Used in Electronic Repair and Fabrication; Soldering and Desoldering Techniques; Circuit Wiring Techniques; Cable Formation and Connectors; Schematic Diagrams and Component Identification
Duration - 3 weeks Lectures - 3 hours/week Laboratories - 9 hours/week

ELTR 3118 (Industrial Electronics & Controls)
This course is designed to enable students to understand power supplies, electrical motors and their electronic controllers in ROV applications.
Switched Mode Power Supplies (SMPS); Electrical Machines; Power Electronics; Electronic Controllers for Electrical Drives in ROV.
Duration - 10 weeks Lectures - 4 hours/week = 40 hours total Laboratories - 3 hours/week (6 Labs) = 18 hours total
**COURSE DESCRIPTIONS**

**ELTR 3119 (Data Communications)**
This Data Communications course provides a comprehensive data communications background to ROV candidates. The course starts off with an introduction to analog communications providing a background in amplitude modulation and frequency modulation principles including single-sideband techniques. Then the student is introduced to transmission mediums, protocols and characteristics. This is followed by digital communications systems, data transfer and emphasizes the practical application of fibre in the design and construction of communication systems and networks required for ROV operations. The approach will give the student the required communications background and a hands-on, practical understanding of cable handling, terminating, splicing, testing with optical sources, and power meters.

**Prerequisite** - for ROV students ELTR 1301 (Control Electronics for ROV); for ROV Advanced Technical Certificate students, ELTR 3104 (Electrotechnology) or equivalent

**duration** - 10 weeks

**Lectures** - 4 hours/week

**Laboratories** - 2 hours/week

**ELTR 3120 (Integrated Circuits)**

The purpose of this course is to provide the student with an exposure, understanding of data sheets and working knowledge of various integrated circuits that are related to power controls and instrumentation.

**Power Supply Circuits; Waveform Generators and Comparator Circuits; Packaging Information; Motor Controller integrated Chips; Instrumentation Circuits**

**Prerequisites** - BTech (OI) students - ELTR 2213 (Control Devices and Operational Amplifiers) and CNTL 2111 (AC Motor Controls);

BTech(UV) students - ELTR 1301 (Introduction to Electronic Devices) and ELTK 1303 (Machines and Power Systems)

**duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 2 hours/week = 26 total hours

**ELTR 3202 (Microcomputer Applications)**

This course provides the student with a knowledge of the hardware and software associated with microprocessor systems and peripherals. The course provides opportunity for students to develop interest in microcomputer systems through project work.

**Microprocessor Types; Displays; Keyboards; Microcomputer Buses; Printers; Plotters; Tape and Disk Storage; Operating Systems; High Level Languages**

**Prerequisites** - MATH 1103 (Introduction to Calculus); ELTR 3108 (Microcomputer Interfacing)

**duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 1 lab @ 3 hours per week

**ELTR 3208 (Computer Troubleshooting)**

This course applies problem-solving techniques to typical computer equipment repair and maintenance situations. Students will use divergent thinking methods to create solutions and convergent thinking to apply the solutions. The course provides opportunity for students to develop interest in microcomputer systems through project work. On completion of this course the successful student will have demonstrated that he/she has acquired a detailed knowledge of computer systems sufficient to perform planned and corrective maintenance on computer workstations.

**Problem Solving Techniques; Basic Computer Service Concepts; PC Architecture; Microprocessor Types; PC Memory Architecture; Disk System Architecture; PC Bus Architecture; Computer Displays; Peripheral Devices; Networking Fundamentals; Troubleshooting Techniques**

**Prerequisite** - CPKS 1101 (Computer Operations)

**duration** - 13 weeks

**Lectures** - 3 hours per week

**Laboratories** - 3 hours/week

**ELTR 3209 (Introduction to Computers and Networking)**

This course introduces students to the field of digital electronics, and computer systems and networks. It is designed to give students a basic understanding of the computer based control systems being used in modern marine applications.

**Introduction to Digital Circuits; Combinational Logic; Computer Fundamentals; Networking Fundamentals; Troubleshooting Techniques; Computer and Other Microprocessor Based Applications on Board Vessels**

**Prerequisite** - CNTL 2110 (Instrumentation, Controls & Automation)

**duration** - 13 weeks

**Lectures** - 4 hours/week = 52 hours total

**Laboratories** - 2 hours/week

**ELTR 3210 (Advanced Microcomputer Interfacing)**

This course provides the student with advance knowledge of the hardware associated with a microprocessor system and the interfacing requirements for communication with the environment.

**Pentum Processors Features; Analog Input/Output; Embedded Systems; C++ Programming; Mixing Assembler and C++; Advanced Interfacing Design and Applications**

**Prerequisites** - ELTR 3211 (Introduction to Microcomputer Interfacing)

**duration** - 13 weeks

**Lectures** - 4 hours/week = 52 hours total

**Laboratories** - 3 hours/week = 39 hours total

**ELTR 3211 (Control Devices and Systems)**

The purpose of this course is to provide the student with an understanding of the theory relating to Control devices and systems, including Bode analysis. The theory covered in class will be applied and validated during the laboratory periods.

**Transducers and Sensors; Process Control Theory; Bode Analysis**

**Prerequisites** - ELTR 1301 (Introduction to Electronic Devices); ELTR 2116 (Industrial Electronics and Controls)

**duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 1 lab @ 3 hours per week = 39 hours total

**ELTR 3212 (Networking Basics)**

This introductory course in local area networks, wide area networks, and industrial area networks covers the various levels of network protocols, from the lowest hardware levels to the highest application protocols.

**Network Environment; Network Reference Models; Area Networks; Network Routing; Network Management; Networked Applications; Industrial Networks**

**Prerequisite** - CPKS 1102 (Introduction to Programming); ELTR 2102 (Digital Logic)

**duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 3 hours/week = 39 hours total

**ELTR 3400 (Electronic Communications)**

This Data Communications course provides a comprehensive data communications background for Ocean Instrumentation Candidates. The course starts off with an introduction to analog communications providing a background in amplitude modulation and frequency modulation principles including single-sideband techniques. Then the student is introduced to transmission mediums, protocols and characteristics. This is followed by digital communications systems, data transfer and emphasizes the practical application of fibre in the design and construction of communication systems and networks required in the field of Ocean Instrumentation.

**Introduction to Analog Communications; Amplitude Modulation and AM Systems; Single-Sideband Techniques; Frequency and Phase Modulation; Transmission Mediums and Protocols; Transmission Characteristics; Digital Communications Systems; Data Transfer; Sensors and Data Collection**

**Prerequisite** - ELTR 1200 (Electrotechnology); ELTR 1102 (Electronic Devices); ELTR 2113 (Fibre Optics)

**duration** - 13 weeks

**Lectures** - 3 hours per week = 39 total hours

**Laboratories** - 3 hours per week = 39 total hours

**ENGR 0105 (Engineering Drawing)**

This is a basic course in the fundamentals of engineering drawing.

**Drafting Fundamentals; Applied Geometry; Orthographic Projection; Dimensioning; and Production Processes and Operations**

**duration** - 13 weeks

**Lectures** - 2 hours/week

**Laboratories** - 2 hours/week

**ENGR 0107 (Blueprint Reading and Interpretation)**

This course is designed to develop the skills necessary for the student to interpret working drawings and prints common to industry and offshore fabrication.

**Purpose and Make-up of Blueprints; Basic Lines and Views; Sketching; Notes and Specifications; Dimensions; Structural Shapes; Other Views; Sections; Detail and Assembly Prints; Abbreviations and Symbols; Welding Symbols; Blueprint Reading and Layout and Piping Drawings.**
ENGR 0108 (Engineering Graphics)
This course is designed to develop the skills necessary for the student to interpret working drawings and prints common to industry.

Drafting Fundamentals, Notes and Specifications, Dimensions, Bill of Materials, Sections, Working Drawings, Abbreviations and Symbols, Production and Processes, Welding Symbols, Piping Drawings, Electrical Drawings, Fasteners

Duration - 13 weeks
Lectures/Laboratories - 50 hours/week

ENGR 1101 (Engineering Drawing)
This is an introductory level course designed to provide students with the basics of mechanical drafting and freehand sketching. Included will be topics addressing drafting fundamentals, use of drafting equipment, and informative retrieval from mechanical blueprints. This course is NOT a drafting course nor a course directed to CAD.

Drafting Fundamentals; Applied Geometry; Orthographic Projection; Sectional Views; Dimensioning; Detail and Assembly Working Drawings

Duration - 13 weeks
Lectures/Laboratories - 3 hours/week

ENGR 1102 (Engineering Drawing)
This course is designed to build on the basic drafting completed in ENGR 1103 (Engineering Graphics) with primary application to marine machinery assembly drawings. The student will apply basic machine shop and engineering knowledge to select materials and make working assembly drawings, using traditional methods, of selected marine machinery. Drawing diagram reading exercises are used to extract information as required in the work place.

Engineering Drawing Basics; Piping Drawings; Welding Drawings; Electrical Drawings; Assembly Drawings; Equipment Operation Manuals and Ship Drawings

Prerequisite - ENGR 1101 (Engineering Drawing) or equivalent
Duration - 13 weeks
Lectures - 4 hours/week = 13 hours
Laboratories - 2 hours/week = 26 hours

ENGR 1103 (Engineering Graphics)
Engineering Graphics provides visually oriented data that is usable by technical, engineering, and manufacturing personnel to assist in the production of goods and services. The method of creating Engineering Drawings has changed from manual drafting to Computer Aided Drafting; however, the technical content of Engineering Graphics has not changed.

Introduction to Technical Drawing; Geometric Constructions; Orthographic Projection; Pictorial Sketching; Dimensioning; Sectional Views

Duration - 13 weeks
Lectures - 2 hours/week = 26 hrs total
Laboratories - 2 hours/week = 26 hrs total

ENGR 1104 (Engineering Graphics)
Engineering Graphics provides visually oriented data that is usable by technical, engineering, and manufacturing personnel to assist in the production of goods and services. The method of creating Engineering Drawings has changed from manual drafting to Computer Aided Drafting.

Introduction to CAD; Editing Existing Entities; Advanced Drawing Construction; Dimensioning Variables; Plotting

Prerequisites - ENGR 1103 (Engineering Graphics)
Duration - 5 weeks
Lectures/Labs - 8 hours/week = 40 hours

ENGR 1105 (Engineering Graphics)
This course is designed to develop the skills necessary for the student to interpret working drawings and prints common to industry.

Drafting Fundamentals; Notes and Specifications; Dimensions; Bill of Materials; Sections; Working Drawings; Abbreviations and Symbols; Production and Processes; Welding Symbols; Piping Drawings; Electrical Drawings, Fasteners

Duration - 6 weeks
Lectures - 4 hours per week = 24 total hours

ENGR 2104 (Blueprint Reading)
This course is designed to develop the skills necessary for the student to interpret working drawings and prints common to industry.

Basic Fundamentals; Sketching; Notes and Specifications; Dimensions; Bill of Materials; Sections; Working Drawings; Abbreviations and Symbols; Production and Processes; Welding Symbols; Piping Drawings; Electrical Drawings; Hydraulic Drawings, Fasteners

Lectures - 40 hours

ENSY 1101 (Prime Movers & Auxiliary Power Plants)
This course is designed to provide the students with the engineering knowledge needed to participate in the design of ship power plants and systems.

Ship Power Plants; Marine Diesel Engines; Marine Gas Turbines; Marine Steam Generators; Marine Steam Turbines

Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

ENSY 1200 (Auxiliary Components)
This is an introductory course designed to give students a knowledge and understanding of the components required to design and construct the auxiliary piping systems of ships and offshore platforms.

Marine Materials, Piping for Marine Application; Valves; Strainers and Steam Traps; Piping Supports and Expansion Joints; Vibration Isolators; Pipe Insulation; Heat Exchangers; Piping Arrangement Drafting

Prerequisite - ENGR 1100 (Engineering Graphics)
Duration - 5 weeks
Lectures - 6 hours/week
Laboratories - 4 hours/week
ENSY 1201 (Ship Types And Systems) This is an introductory course designed to provide students with engineering knowledge about ship types. Introduction to Modern Ship Concept; Ship Terminology; Materials Used in Ship Construction; Commercial Ships; Special Purpose Ships; Dynamically Supported Vessels; General Arrangement Drawing; Ship Operations Onboard M.I. Training Vessel; Propulsion Systems; Prime Movers; Pumping and Piping Systems; Control Systems; Marine Engineering Drawing Prerequisite - ENGR 1100 (Engineering Graphics) Duration - 5 weeks

ENSY 1202 (Introduction to Marine Engineering Systems Design) This is an introductory course designed to provide students with practical knowledge of the ship’s environment, ship terminology and the various elements of Marine Engineering Systems Design. The Ship’s Environment; Ship Terminology; Hull Form; Pumps; Pumping and Piping Systems; Piping for Marine Applications; Valves Co-requisite - Engineering Graphics 1103 Duration - 13 weeks Lectures - 3 hours/week = 39 hours total Laboratories - 1 hour/week = 13 hours total

ENSY 2000 (Ship Engineering Design Process) This course sets the methodology for the development of the student’s engineering design project. At the same time it offers an opportunity to assimilate some economic aspects by preparing an owner specification in conjunction with an economic study. Analysis and Response to Request For Proposal; Indexing and Scheduling; Estimating Ship Construction Costs and Life Cycle Costing; Design Package Documentation; Relationship of Auxiliary Systems to Vessel Type; Quality Control in Shipbuilding Prerequisites - ENSY 1202 (Introduction to Marine Engineering Systems Design) Co-requisite - CMISK 1201 (Communication at Work) Duration - 5 weeks Lectures - 6 hours/week = 30 hours total Laboratories - 2 hours/week = 10 hours total

ENSY 2102 (Propulsion Systems) This course is designed to provide the students of the Marine Engineering Systems Design program with the engineering knowledge needed to participate in the professional process of ship propulsion systems design. Ship Propulsion Units Geometry and Function; Propulsion Shafting Arrangement; Propulsion Shafting Components Design and Selection; Propellers; Thrusters; Reduction Gears and Other Transmission Systems; Electric Propulsion Motors; Ship Propulsion Shafting Vibration; Installation Procedures and Testing Prerequisites - ENSY 1202 (Introduction to Marine Engineering Systems Design) NARC 1102 (Ship Structural Geometry)

ENSY 2103 (Power and Resistance Technology) This course introduces students to the concepts associated with ship propulsion and resistance. The course prepares students to perform calculations associated with propulsion and propeller selection. Introduction to Ship Resistance; Ship Friction Resistance; Wave Making Resistance; Other Ship Resistance Components; Similarity and Model Testing; Ship Power and Propulsion; Screw Propellers; Propeller Ship Interaction; Propeller Series; Propeller Cavitation Prerequisites - Math 1101 (Introduction to Calculus); FLDS 2100 (Fluid Mechanics) Duration - 13 weeks Lectures - 3 hours/week = 39 hours total Laboratories - 2 hours/week every week for 13 weeks = 26 hours; 65 hours total

ENSY 2200 (Auxiliary Systems I) This is a technical course structured to give students the necessary knowledge of how auxiliary systems must function and the operational criteria which must be considered in order to design a given system. Various permutations are considered depending on vessels types. The end result will be the production by the student of his or her own vessel diagrams for the subject systems. Tank Capacities; Bilge Systems, Ballast Systems; Fire Systems; Sea and Fresh Water Cooling Systems; Fuel Oil Systems Prerequisites - ENSY 1202 (Introduction to MEDES); CMISK 1201 (Technical Communications 2) Duration - 13 weeks Lectures - 3 hours/week Laboratories - 1 hour/week

ENSY 2201 (Auxiliary Systems II) This course completes the Auxiliary Systems aspect of the program, permitting the student to assimilate the functions and operating criteria and to apply them to the design of the systems listed below. Production of some systems in diagrammatic form will help in the assimilation of the subject matter. Sanitary Supply and Discharge Systems; Lubricating Oil Systems; Compressed Air Systems; Exhaust Gases Systems and Gas Turbine Intakes; Hull Machinery Systems Prerequisites - ENSY 2200 (Auxiliary Systems I) Duration - 13 weeks Lectures - 3 hours/week Laboratories - 2 hours/week

ENSY 2202 (Ship's Spaces Ventilation) This course is designed to give the students a knowledge and understanding of how to calculate the heat accumulation from all operating equipment, size, select and produce drawings for the ventilation systems of all machinery spaces. All required components will be explained and assimilated.
COURSE DESCRIPTIONS

ENSY 3300 (Ship Engineering Project)
This course is structured so that the student will prepare the first phase of most documents required for a design project package. The results from other specialized courses are incorporated in the preparation of this Ship Engineering Project.
Machinery Arrangement; Ventilation Arrangement; Exhaust Arrangement; Sea Suction Technology; Bow Thruster Compartment; Auxiliaries
Prerequisites: ENSY 2102 (Power and Resistance Technology); ENSY 2103 (Power Engineering - Unit Operations)
Duration - 13 weeks
Lectures - 1 hour/week
Laboratories - 4 hours/week

ENSY 3301 (Ship Engineering Project)
This course is structured to bring to completion, the preparation of the documents required for a design project package started with the course Systems Design Project 3100. In addition to original work the results of other specialized courses are also incorporated in the machinery arrangement of the ship engineering project.
Machinery Arrangement; Specification; Auxiliary Components; Finishing; Calculation Book; Presentation of Systems; Presentation Methods; Final All Day Exam
Prerequisites: ENSY 3300 (Ship Engineering Project)
Duration - 13 weeks
Lectures - 1 hour/week
Laboratories - 4 hours/week

ENSY 3302 (Marine Electrical Project)
This is a project course designed for advanced Marine Engineering Systems Design students. It is intended to familiarize the students with the design of the electrical system aboard ships and to enable them to complete the electrical design required for their technical project.
Planning; System Analysis; Project Research; System Design; Report Preparation; Report Presentation
Prerequisites: ELTK 2102 (Marine Electrical Systems)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 4 hours/week

ENSY 3303 (Project Presentation)
This course will showcase work completed on student project vessels and will demonstrate the practical application of resolving a design problem through applied research. Definition of the problem, analysis and potential technical solutions to the design problem will be established through research and presented to an audience of peers.
Design Problem Definition; Generation of Alternatives and Solutions; Evaluation of Solutions; Presentation Techniques
Prerequisites: ENSY 3301 (Ship Engineering Project); ENSY 3302 (Marine Electrical Project); ENSY 3303 (Auxiliary Machinery Arrangement); ENSY 3304 (Piping Arrangement Design)
Duration - 5 weeks
Lectures - 4 hours/week = 20 hours
Laboratories - 6 hours/week = 30 hours

FDTE 1100 (Introduction to Food Science & Technology)
An introductory course that describes the fields of food science and food technology including introductions to nutrition, food chemistry, microbiology, and food processing. Selected aspects of marketing and product development will also be introduced. Design, scope, functions and contemporary problems of the food industry will be discussed. The laboratory component will involve a study of common methods of food processing/preservation.
Food Science and Technology; Characteristics of the Food Industry; Food Constituents; Nutrition; Food Changes; Causes and Controls; Food Processing; Marketing and Product Development; Specialty Foods; Issues
Duration - 13 weeks
Lectures - 39 hours (3 hours/week)
Laboratories - 26 hours (2 hours/week)

FDTE 2101 (Food Engineering Principles)
This is an advanced level course designed to provide the student with a rudimentary understanding of food engineering principles enabling students to comprehend food engineering applications and unit operations.
Introduction; Energy and Mass; Liquid Food Transport/Rheology; Energy for Food Processing; Heat Transfer in Food Processing; Refrigeration; Freezing of Food; Evaporation; Psychrometrics; Dehydration of Foods
Prerequisites - MATH 1200 (Calculus); PHYS 1200 (Physics)
Duration - 39 hours
Laboratories - 26 hours

FDTE 2104 (Seminar Series)
This course will present participants with selected topics of relevance to food technology.
Current Issues in Food Technology
Duration - 13 weeks

FDTE 2105 (Nutrition)
This course provides the basics concepts in nutrition and introduces the nutrients of importance to human nutrition.
Nutrients and Nourishment; Nutrition Guidelines and Assessment; Digestion and Absorption; Carbohydrates and Dietary Fibre; Lipids; Proteins; Minerals and Vitamins; Water
Prerequisite - FDTE 1100 (Introduction to Food Science & Technology)
Duration - 39 hours

FDTE 2112 (Food Hygiene and Food Safety)
This course is designed to introduce students to the various aspects of food safety and to provide students the necessary tools to design, implement and effective sanitation program.
Sanitation Programs for Foods; Hazard Avoidance and Quality Management; Cleaning and Sanitizing; Micro-organisms; Personal Hygiene; Pest and Pest Control; Food Plant Design and Equipment Design; Sanitation of Incoming Materials; Water Sanitation; Allergens; Waste Treatment; Food Regulations
Prerequisite - BIOL 1100 (Biology)
Duration - 39 hours
Laboratories - 26 hours

FDTE 2200 (Food Processing I)
This course is designed to provide students with an understanding of protein foods, their composition and their role in the food industry. It provides an overview of the role of the Canadian Food Inspection Agency (CFIA) in the production and processing of these foods.
Business Aspects; Red Meat; Poultry and Eggs; Dairy Production; Seafood; Government Regulations
Prerequisites - BIOL 1100 (Biology); FDTE 1100 (Introduction to Food Science and Technology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 3 hours/week

FDTE 3100 (Food Engineering - Unit Operations)
This is an advanced level course designed to introduce food engineering unit operations to students.
Introduction; Preliminary Operations; Conversion Operations; Preservation Operations; Materials Handling
Prerequisite - FDTE 2103 (Food Engineering Principles)
Duration - 39 hours
Laboratories - 26 hours

FDTE 3101 (Food Biotechnology)
This is an advanced level course designed to provide the student with an understanding of the various aspects of food biotechnology.
Overview: Food Biotechnology; Tools of Biotechnology; Cell Culture Technology; Plant Cell Culture; Fermentation Technology; Enzyme Technology; Immobilization Technology; Applications in Agriculture; Applications in Food; Marine Biotechnology; Safety of Foods Developed by Biotechnology; Biotechnology in Waster Management in Food Industry; Biosensors for Biomedical Monitoring; Safety and Regulatory Issues of Biotechnology-derived Foods
Introduction to Site Microbiology; Product Preparation; Processing Equipment and Procedure; Container Integrity; Post Container Handling; Incubation; Regulations and Codes of Practice
Prerequisite - High School graduation OR recommended by employer.
Duration - 5 days (35 hours)
**Course Descriptions**

### Prerequisites - BIOL 2202 (Food Microbiology); CHEM 2102 (Biological Chemistry); FDTE 3107 (Food Processing II)

- **Duration**: 13 weeks
- **Lectures**: 3 hours per week = 39 hours total

**FDTE 3102 (Food Safety Enhancement Program/Hazard Analysis Critical Control Point)**

This course provides participants with an understanding of the concepts, principles, terminology, and skills required for the development, implementation, maintenance, validation, and reassessment, and auditing of the FSEP/HACCP system within food processing establishments.

Introduction to HACCP and FSEP; FSEP Prerequisite Programs; Development of a HACCP Plan; Hazard Analysis; Critical Control Point Determination; Validation and Reassessment of the HACCP Plan; Audit Principles

- **Duration**: 3 days

**FDTE 3103 (Hazard Analysis Critical Control Point)**

This course is designed to provide participants with an understanding of requirements of the Hazard Analysis Critical Control Point (HACCP) system that exists in federally registered fish processing establishments.

HACCP System; HACCP Program Development; Preliminary Steps of HACCP Development; Conduct a Hazard Analysis (HACCP Principle # 1); Determine Critical Control Points (HACCP Principle # 2); Establish Critical Limits (HACCP Principle # 3); Establish Monitoring Procedures (HACCP Principle # 4); Establish Corrective Action Procedures (HACCP Principle # 5); Establish Verification Procedures (HACCP Principle # 6); Establish Documentation and Record Keeping (HACCP Principle # 7)

- **Duration**: 2 days

**FDTE 3104 (Quality Management Program)**

This course is designed to provide participants with an understanding of requirements of the Quality Management Program (QMP) that exist in federally registered fish processing establishments.

QMP Reference Standard; Management Roles and Responsibilities; Background Product and Process Information; Prerequisite Plan; Regulatory Action Point (RAP) Plan; Hazard Analysis Critical Control Point (HACCP) Plan; Verification and Maintenance of the QMP Plan; Record Keeping; Auditing of the QMP Plan.

- **Duration**: 3 days

**FDTE 3106 (Seafood Processing Technology)**

This course is designed to familiarize students with the techniques and technology involved in the production of seafood products.

Fisheries Overview; Preservation Methods; Primary Processing; Secondary Processing; By-products Utilization

Prerequisites - QLAS 2104 (Food Evaluation)

- **Duration**: 13 weeks
- **Lectures**: 3 hours/week = 39 hours total

**FDTE 3107 (Food Processing II)**

This course is an advanced level course designed to provide the student with an understanding of a variety of food processing techniques for foods of plant origin.

- **Duration**: 13 weeks
- **Lectures**: 3 hours/week = 39 hours total

**FDTE 3108 (An Introduction to Food Manufacturing Food Safety Standards)**

This course provides participants with an understanding of the concepts, requirements, terminology, and skills required for the implementation and validation of a third-party food manufacturing food safety standard within food processing establishments.

Global Food Safety Initiative (GFSI); Governance of the Food Safety Standards; British Retail Consortium Standard (BRC); Safe Quality Food Standard (SQF); Food Safety System Certification 22000 (FSCC 22000); Global Red Meat Standard (GRMS); International Features Standard (IFS)

- **Duration**: 3 days

**FDTE 4100 (World Food Industry Overview)**

This introductory course is designed to give students a basic understanding of the food industry. The course covers the history of foods, preservation methods, packaging, food safety, and the various components that make up the food industries.

History of World Food Production; Food and Human Consumption; Processes for Food Preservation; Packaging of Foods; Food Safety; Meat, Poultry and Fish; Fruit and Vegetables Industry; Dairy Industry

- **Duration**: 39 hours total
- **Lectures**: 39 hours total

**FDTE 4102 (Food Inspection Techniques)**

This course is designed to provide general guidelines useful for a wide range of inspection activities for monitoring the safety and quality of foods.

Overview of Food Safety; General Inspection Approach; Sampling; Consumer Reactions to Food Safety Crises; Subjective and Objective Methods; Special Investigations; Evidence Development; Risk Management; Export-Import Surveillance; Foreign Bodies in Food

- **Duration**: 13 weeks
- **Lectures**: 3 hours per week = 39 hours total

**FDTE 4104 (Food-Borne Diseases/Toxicology)**

This course is designed to provide the student with the knowledge of the biological and chemical agents associated with foods and their effect on human health.

- **Duration**: 13 weeks
- **Lectures**: 2 hours per week = 26 hours total

**FDTE 4105 (Food Hygiene and Food Safety)**

This course is designed to provide students with an detailed information concerning sanitation and good hygiene practices.

- **Duration**: 13 weeks
- **Lectures**: 2 hours per week = 26 hours total

**FDTE 4110 (Introduction to Water and Wastewater Treatment)**

This course is designed as an introduction to water and wastewater treatment systems to provide a foundation for further study in the subject.

- **Duration**: 7 weeks
- **Lectures**: 2 hours/week

**FDTE 4111 (Food Processing)**

This introductory course is designed to provide students with a basic understanding of food processing. The course covers the history of food processing and provides an overview of processing in the meat, poultry and egg, dairy, seafood, grains, and fruits and vegetables sectors of the food industry. It also covers food preservation methods and packaging considerations, two vital and integral components relevant to all sectors of the food processing industry.

- **Duration**: 40 hours (8 hours per week for 5 weeks)

**FDTE 4204 (Water and Wastewater Processing II)**

This course is designed to provide students with an understanding of water and wastewater systems operation and maintenance emphasizing troubleshooting, efficiency, liability and safety.

Instrumentation and Controls Systems for Water and Wastewater Systems; Water Distribution System Operation and Maintenance; Water Treatment Plant Operation and Maintenance; Wastewater Collection System Operation and Maintenance; Wastewater Treatment Plant Operation and Maintenance; Septic Tanks and Associated Pumps; Safety; Administration and Record Keeping

- **Duration**: 26 hours
- **Lectures**: 24 hours (6 hours per week for 4 weeks)

**FIRE 0011 (Firefighter - Level 1)**

This introductory level course is designed to provide the student with the theoretical and practical training to function as an integral member of a firefighting team. It meets and/or exceeds National Fire Protection Association (NFPA) 1001 Professional Standards.

Firefighter Orientation; Firefighter Safety and Health; Fire Behaviour; Building Construction; Firefighter Personal Protective Equipment; Portable Fire Extinguishers; Ropes and Knots; Rescue and Extrication; Forkable Entry; Ground Ladders; Ventilation; Water Supply; Fire Hose; Fire Streams; Fire Control; Fire Detection; Alarm and Suppression Systems; Loss Control; Protecting Fire Scene Evidence; Fire Department Communications

- **Duration**: 40 Hours (8 hours per week for 5 weeks)
- **Laboratories**: 24 hours (6 hours per week for 4 weeks)
NOTE: Successful completion of NFPA 472 Hazardous Materials Awareness and Operations is required in order to receive Certification in NFPA 1001 – Firefighter – Level I
Duration - 25 days
Lectures - 10 days
Practical Exercises - 15 days

FIRE 0021 (Level C - CPR)
An approved training provider will deliver this one-day course.

FIRE 0026 (Marine Based Fire Fighting For Land-Based Firefighters (Awareness Level))
This course introduces the land-based firefighter to the many aspects of marine firefighting that require special attention due to the unique environment encountered onboard vessels.

FIRE 0027 (Advanced Medical First Responder Level II (80 hours))
An approved training provider will deliver this 10-day course.

FIRE 0030 (Fire Pumper Driver/Operator)
This course is designed to give students the knowledge to operate and to maintain a fire pumper in safe working condition.

FIRE 0032 (Rescue Technician)
This is a basic Rescue Technician course that introduces the student to both the theoretical and practical aspects of rescue techniques. This course incorporates high angle rescue, confined space entry, and rescue and vehicle extrication techniques to meet NFPA 1008 standard.

Personal Protective Equipment; Rope and High Angle Rescue Equipment; Rappelling Techniques; Ascending Techniques; Rescue Techniques; Confined Spaces; Detection Equipment; Pumping and Ventilating; Entry Procedures; Confined Space Rescue; Psychological Aspects of a Confined Space Rescue; Vehicle Construction; Extrication Equipment; Extrication Procedures; and Extrication Equipment Maintenance.
Prerequisites - Fire 0027 (Emergency Medical Responder (80 hours)); Fire 0011 (Firefighter I) OR Basic Fire Fighting Certificate; Medical Clearance according to Mi policy
Duration - 20 days
Theory - 7.5 days
Practical - 12.5 days

FIRE 0034 (Firefighter II)
This course is designed to provide the student with the theoretical and practical training to function as an integral member of a fire suppression or rescue team.
Duration - 20 days
Theory - 5 days
Practical - 15 days

FIRE 0035 (Hazardous Materials Operations)
This is an introductory level course designed to enable students to identify dangerous goods incidents and properly perform isolation and evacuation procedures.

Duration - 7.5 days (45 hours)
Theory - 5.5 days (33 hours)
Practical Exercises - 1 day (6 hours)
Testing - 1 day (6 hours)

FIRE 0036 (Hazardous Materials Awareness)
This is an introductory level course designed to enable students to identify dangerous goods incidents and properly perform isolation and evacuation procedures.
Introduction to Hazardous Materials; Hazardous Materials Identification; Awareness-Level Actions at Hazardous Materials Incidents
Prerequisite - Entry into the Fire Rescue Program
Duration - 2.5 days (17.5 hours)
Theory - 1.5 days (10.5 hours)
Practical Exercises - 0.5 days (3.5 hours)
Testing - 0.5 days (3.5 hours)

FIRE 0037M Technical Rescuer (Vehicle and Machinery Extrication Level I and II)
Level I:
This is a Technical Rescuer Course that introduces the student to both the theoretical and practical aspects of Vehicle and Machinery Extrication Techniques. This course incorporates Vehicle and Machinery Extrication and Core Skill (Chapter 5) Techniques to meet or exceed National Fire Protection Association (NFPA) 1006 Professional Standards, Level I.
Level II:
This is a Technical Rescuer Course that introduces the student to the more advanced theoretical and practical aspects of extrication focusing on Heavy Vehicle and Machinery Extrication Techniques. This course incorporates Vehicle and Machinery Extrication Level II Core Skill Techniques to meet or exceed National Fire Protection Association (NFPA 1006) Professional Standards, Level II.

FIRE 0038M Technical Rescuer (Confined Space Rescue Level I and II)
Level I:
Introduction to Confined Space; Confined Space Entry; Confined Space Entry Equipment; Confined Space Entry Techniques; Passenger Vehicle Extrication; Emergency Medical Services (EMS) Rescue Considerations
Level II:
Heavy Vehicle and Machinery Classification; Bus Extrication; Medium and Heavy Truck Extrication; Railcar Extrication; Industrial / Agricultural Vehicle and Machinery Extrication; Specialized Heavy Vehicle and Machinery Extrication; Heavy Vehicle and Machinery Incident Assessment; Hazards Associated with Heavy Vehicles and Machinery; Extrication Tools and Equipment for Heavy Vehicles and Machinery; Heavy Vehicle and Machinery Stabilization; Victim Removal from Heavy Vehicles and Machinery
Prerequisites - FIRE 0038M - Technical Rescuer (Roof Rescue Level I and II)

FIRE 0039M Technical Rescuer (Confined Space Rescue Level I and II)
Level I:
This is a Technical Rescuer Course that introduces the student to both the theoretical and practical aspects of Confined Space Rescue Techniques. This course meets or exceeds National Fire Protection Association (NFPA) 1006, Level I professional standards.
Level II:
Rappelling Operations; Lowering Systems; Mechanical Advantages; Raising, and Ascending Systems; Tensioned Rope Systems
Prerequisites - FIRE 0011 (Firefighter I - Level I)

NOTE: For successful completion of NFPA 1006 Technical Rescuer - Vehicle Extrication Certification, students must have successfully completed certification in NFPA 1006 for CORE and also certification will not be received for Level II until successful completion of Vehicle and Machinery Extrication Level I.

Duration - Classroom - 5 days
Practical - 5 days
Total - 10 days
Please note that in addition to the 10 days duration above there will be a Complete Skills Review and NFPA Testing component to be shared among the three Technical Rescuer Courses (Roof Rescue, Confined Space and Vehicle Extrication) that will amount to another 10 days.

FIRE 0038M Technical Rescuer (Rope Rescue Level I and II)
Level I and II:
This is a Technical Rescuer Course that introduces the student to the theoretical, practical, and advanced aspects of Rope Rescue Techniques. This course incorporates the High Angle and Core Skill (Chapter 5) techniques to meet or exceed National Fire Protection Association (NFPA) 1006 professional standards, Levels I and II.
Level I:
Introduction to Rope Rescue; Incident Planning and Scene Management; Safety; Equipment and System Components; Knots; Anchor Systems; Raising; Rappelling; Lowering Systems; Mechanical Advantages, Raising, and Ascending Systems
Level II:
Rappelling Operations; Lowering Systems; Mechanical Advantages; Raising, and Ascending Systems; Tensioned Rope Systems
Prerequisites - FIRE 0011 (Firefighter I - Level I)

NOTE: For successful completion of NFPA 1006 Technical Rescuer - Rope Rescue students must have successfully completed certification in NFPA 1006 for CORE and also certification will be received for Level II until successful completion of Rope Rescue Level

Duration - Classroom - 5 days
Practical - 5 days
Total - 10 days
Please note that in addition to the 10 days duration above there will be a Complete Skills Review and NFPA Testing component to be shared among the three Technical Rescuer Courses (Rope Rescue, Confined Space and Vehicle Extrication) that will amount to another 10 days.

FIRE 0038M Technical Rescuer (Confined Space Rescue Level I and II)
Level I:
This is a Technical Rescuer Course that introduces the student to both the theoretical and practical aspects of Confined Space Rescue Techniques. This course meets or exceeds National Fire Protection Association (NFPA) 1006, Level I professional standards.
to another 10 days.

Rescue, Confined Space and Vehicle Extrication) that will amount in addition to the 10 days duration above there Please note

Total Practical Total - 10 days

Please note that in addition to the 10 days duration above there will be a Complete Site Review and NFPA Testing component to be shared among the three Technical Rescue Courses (Rope Rescue, Confined Space and Vehicle Extrication) that will amount to another 10 days.

FIRE 0040 (Flashover Recognition)

This course provides theoretical and practical skills to enable students to recognize the signs of a flashover situation and be able to react accordingly for their personal safety.

Fire Development in a Compartment; Fire Control Theory; Flashover Safety

Prerequisites - FIRE0011 (Firefighter - Level 1)

Duration - 70 hours

Theory - 4 hours

Practical - 3 hours

FITE 0001 (Introduction to Fishing Gear Construction and Repair)

This course introduces participants to fishing gear construction and repair.

Introduction to Trawls; Basic Net Making Knowledge; Basic Net Repair; Application of Conservation Technologies; Mobile Gear Construction and Repair Techniques; Trawl Operations and Further Equipment; Net Making for Fixed Gears; Principles and Uses of Rope and Wire

Duration - 10 days

FITE 0002 (Introduction to Construction and Stability for Fishing Vessels)

Fishing vessel construction and stability are important, interconnected areas of study to ensure the safe operation and handling of fishing vessels. It is essential that vessel operators have a good understanding of the relationships that exist between the vessels shape, builder’s plans and how a completed hull operates in a marine environment. This course is specifically directed towards fishing vessel operators and deals with the basic theory and application of construction and stability as it applies to fishing vessels in various conditions of load.

Basic Ship Measurement and Design Terminology; Hull Shapes and Structural Terminology; Vessel Seaworthiness and Regulatory Requirements; Essential Vessel Systems and Inspection Protocol; Basic Ship Stability Terminology; Basic Transverse Stability Principles; Interpreting Righting Lever Curves; Basic Longitudinal Stability Principles; Principles of Free Surface Effect; Need for and Reserve Buoyancy; Anti Roll Devices and Vessel Stability; Vessel Modifications and Its Effect on Stability; Interpreting Stability Booklet Data; Effect of Fishing Operations on Vessel Stability; Environmental Effects on Stability - The Dynamics

Duration - 10 Days (70 Hours)

FITE 0004 (Information Systems in Fisheries)

This course has been developed to enable the fish harvester to maximize the use of the computer at sea. This course includes distinct components of electronic navigation, managing fishing data, collision avoidance and communication.

The Windows® Operating System Environment; Electronic Navigational Chart – Definitions, Concepts and Related Authorities; Legal Aspects and Requirements for Fishing Vessels; Sensors and Interfaces; Electronic Chart Data; Navigating with the Electronic Charting System; Passage Planning with the Electronic Chart; Executing and Monitoring the Passage Plan; Charts, Alarms and Indicators; Risk of Over-reliance: Fishing Data Management; Back-up Arrangements; Collision Avoidance Information Management; Bottom Mapping; Communications

Prerequisites - Chartwork and Pilotage Level 1 (C&P 1) or equivalent

Duration - 70 hours = 10 days

FITE 0005 (Ropework)

This course is designed to develop the participant’s ability to understand the design and construction of various types of rope, maintenance and inspection of ropes, and regulations governing rope usage. It will include rope safety, rope use and maintenance for small vessels, and moorings and anchoring.

Ropes; Knots, Bends and Hitches; Ropework/Working with Ropes; Rope Safety; Mooring and Anchoring

Duration - 2.5 days

FDLS 1200 (Introduction to Fluid Mechanics & Hydraulics)

This course is designed as an introduction to the laws and principles that govern Fluid Mechanics and Hydraulics. Students will be able to apply these principles to relevant ROV applications.


Prerequisites - PHYS 1100 (Physics) or PHYS 1101 (Physics) or PHYS 1102 (Physics)

Duration - 13 weeks

Lectures - 4 hours/week = 52 hours total

Laboratories - 2 hours/week every second week for 6 labs = 12 hours.

FDLS 2100 (Fluid Mechanics)

This is an introductory Fluid Mechanics course designed to develop both the knowledge of the laws and principles governing Fluid Mechanics and the ability to apply this knowledge in analyzing related engineering applications. The course also provides a base for advanced courses in piping design, ducing design, and fluid power systems.

Introduction to Fluid Mechanics; Forces on Submerged Surfaces; Work and Energy of Fluids in Motion; Steady Flow of Incompressible Fluids; Flow Measurement

Prerequisites - MATH 1100 (Pre-Calculus) or MATH 1102 (Pre-Calculus); PHYS 1100 (Physics) or PHYS 1101 (Physics) or PHYS 1102 (Physics)

Duration - 13 weeks instruction, exclusive of final examination

Lectures - 3 hours/week = 39 hours total

Laboratories - 2 hours/week every second week for 6 labs = 12 hours

FDLS 2105 (Fluid Mechanics)

This is an introductory Fluid Mechanics course designed to develop both the knowledge of the laws and principles governing Fluid Mechanics and the ability to apply this knowledge in analyzing related engineering applications. The course also provides a base for advanced courses in piping design, ducing design, and fluid power systems.

Introduction to Fluid Mechanics; Forces on Submerged Surfaces; Work and Energy of Fluids in Motion; Steady Flow of Incompressible Fluids; Flow Measurement

Prerequisites - MATH 1100 (Pre-Calculus); PHYS 1103 (Physics)

Duration - 13 weeks instruction, exclusive of final examination

Lectures - 3 hours/week = 39 hours total

Laboratories - 2 hours/week every second week for 6 labs = 12 hours

FDLS 2106 (Introduction to Fluid Statics & Dynamics)

This course is designed as an introduction to the laws and principles that govern Fluid Mechanics. Students will be able to apply these principles to relevant ROV applications.

Introduction to Fluid Mechanics; Forces on Submerged Surfaces; Buoyancy, Forces due to Fluids in Motion, Drag

Duration - 3 weeks

Lectures - 6 hours/week = 18 hours total

Laboratories - 1 hour/week = 3 hours total

FDLS 2107 (Hydraulic Controls)

This is an intermediate level course designed for students in the Remotely Operated Vehicles Operator Program.

Hydraulic Principles; Hydraulic Systems and Schematics; Hydraulic Fluids; Hydraulic Hoses and Pipes; Seals and Packing; Reservoir, Design and Function; Contamination Control and Filtration; Linear Actuators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories

Duration - 10 weeks

Lectures - 3 hours/week = 30 hours total

Laboratories - 2 hours/week = 26 hours total

FDLS 2108 (Introduction to Fluid Statics, Dynamics & Hydraulics)

This course is designed as an introduction to the laws and principles that govern Fluid Mechanics and Hydraulics. Students will be able to apply these principles to relevant ROV applications.

Introduction to Fluid Mechanics; Forces on Submerged Surfaces; Buoyancy and Stability; Work and Energy of Fluids in Motion; Steady Flow of Ideal Fluids; Drag; Hydraulic Principles; Hydraulic System and Schematics; Hydraulic Fluids; Hydraulic Hoses and Pipes; Seals and Packing; Reservoir, Design and Function; Contamination Control and Filtration; Linear Actuators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories

Co-requisite - PHYS 1100 (Physics) or PHYS 1101 (Physics)

Duration - 13 weeks

Lectures - 2 hours per week = 39 hours total

Laboratories - 2 hours every second week for a total of 5 labs = 10 hours total

FDLS 2109 (Advanced Hydraulics)

This course exposes students to more advanced fluid power components and applications by focusing on advanced pump controls, accumulators, intensifiers, servos and proportional electrohydraulics and electrohydraulic troubleshooting.

Hydraulic Principles; Advanced Pump Controls; Accumulators and Intensifiers; Electrohydraulic Components and Systems; Electrohydraulic Servo and Proportional Systems; Electrohydraulic Troubleshooting
### COURSE DESCRIPTIONS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Duration</th>
<th>Lectures</th>
<th>Laboratories</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLDS 1200</td>
<td>Introduction to Fluid Mechanics and Hydraulics; FLDS 2108 (Introduction to Fluid Statics, Dynamics &amp; Hydraulics); FLDS 2201 (Marine Hydraulics); FLDS 3100 (Hydraulics and Pneumatics); or FLDS 3105 (Hydraulics and Pneumatics)</td>
<td>5 weeks</td>
<td>3 hours/week</td>
<td>3 hours/week</td>
<td>None</td>
</tr>
<tr>
<td>FLDS 2201</td>
<td>Marine Hydraulics</td>
<td>13 weeks</td>
<td>3 hours/week</td>
<td>3 hours/week</td>
<td>FLDS 1200</td>
</tr>
<tr>
<td>FLDS 3100</td>
<td>This is an intermediate level course designed to provide Marine Engineering Systems Design students with the engineering knowledge needed to analyze hydraulic installations, specify components, and design shipboard hydraulic systems. Principles of Power Hydraulics, Hydraulic Fluids and Reservoirs, Hydraulic Piping and Fittings, Seals and Packing, Components of Hydraulic Systems, Hydraulic Pumps and Motors (Rotary Actuators), Marine Applications of Hydraulics</td>
<td>13 weeks</td>
<td>3 hours/week</td>
<td>3 hours/week</td>
<td>FLDS 1200</td>
</tr>
<tr>
<td>FLDS 3102</td>
<td>This is an intermediate level course designed primarily for students in the Marine Engineering Technology program. Hydraulic Principles; Hydraulic System and Schematics; Hydraulic Fluids; Hydraulic Hoses and Pipes; Seals and Packing; Reservoir, Design and Function; Contamination Control and Filtration; Linear Actuators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories; Pneumatic Principles; Air Compressors and Receivers; Air Distribution and Auxiliary Equipment</td>
<td>12 hours</td>
<td>2 hours/week</td>
<td>2 hours/week</td>
<td>FLDS 3100</td>
</tr>
<tr>
<td>FLDS 3105</td>
<td>This is an intermediate level course designed primarily for students in the Marine Engineering Technology program. Hydraulic Principles; Hydraulic System and Schematics; Hydraulic Fluids; Hydraulic Hoses and Pipes; Seals and Packing; Reservoir, Design and Function; Contamination Control and Filtration; Linear Actuators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories; Pneumatic Principles; Air Compressors and Receivers; Air Distribution and Auxiliary Equipment</td>
<td>13 weeks</td>
<td>3 hours/week</td>
<td>2 hours/week</td>
<td>FLDS 3100</td>
</tr>
<tr>
<td>FLDS 3106</td>
<td>This course is designed as an introduction to the laws and principles that govern Fluid Mechanics. Students will be able to apply these principles to relevant ROV applications. Introduction to Fluid Mechanics; Forces on Submerged Surfaces; Buoyancy; Forces due to Fluids in Motion; Drag</td>
<td>6 weeks</td>
<td>1 hour/week</td>
<td>1 hour/week</td>
<td>None</td>
</tr>
<tr>
<td>FLDS 3107</td>
<td>This is an intermediate level course designed for students in the Remotely Operated Vehicles Operator Program. Hydraulic Principles; Hydraulic Systems and Schematics; Hydraulic Fluids; Hydraulic Hoses and Pipes; Seals and Packing; Reservoir, Design and Function; Contamination Control and Filtration; Linear Actuators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories</td>
<td>10 weeks</td>
<td>3 hours/week</td>
<td>3 hours/week</td>
<td>FLDS 3106</td>
</tr>
<tr>
<td>FRMG 0001</td>
<td>This course is designed to familiarize fishers with the principles and techniques involved in fisheries management. The Fishery Resource; Why Manage? Understanding the Goals of Fisheries Management; The Methods Employed in Fisheries Management; Managing Our Resources; Agencies and Organizations Involved in Research and Decision-making in Fisheries Resource Management; Sharing Our Resources – Foreign Fishing in the Northwest Atlantic; Responsible Fishing; Owner Operators and Fleet Separation; Stewardship</td>
<td>5 weeks</td>
<td>2 hours/week</td>
<td>2 hours/week</td>
<td>None</td>
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<tr>
<td>GEOG 1301</td>
<td>Surveying and GPS</td>
<td>5 weeks</td>
<td>3 hours/week</td>
<td>2 hours/week</td>
<td>None</td>
</tr>
<tr>
<td>GEOG 1302</td>
<td>Mapping and GIS</td>
<td>5 weeks</td>
<td>3 hours/week</td>
<td>2 hours/week</td>
<td>None</td>
</tr>
<tr>
<td>GEOG 2100</td>
<td>This course is designed to provide students with an understanding of survey techniques. It will introduce students to measurement techniques associated with distance, direction and leveling. It will review traditional survey tools as well as electronic devices including total stations and global positioning systems. Also, students operate survey equipment that is commonly used for coastal and marine applications. Introduction to Surveying; Distance Measurements and Corrections; Leveling; Angles and Directions; Global Positioning System (GPS); Electronic Distance Measurement Instruments (EDM)</td>
<td>3 months</td>
<td>2 hours/week</td>
<td>2 hours/week</td>
<td>FLDS 3105</td>
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<tr>
<td>GEOG 2200</td>
<td>Remote Sensing</td>
<td>5 weeks</td>
<td>2 hours/week</td>
<td>2 hours/week</td>
<td>None</td>
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<tr>
<td>GEOG 3101</td>
<td>Mapping and GIS</td>
<td>5 weeks</td>
<td>2 hours/week</td>
<td>2 hours/week</td>
<td>None</td>
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<tr>
<td>GEOG 3102</td>
<td>Geographic Database Design and Management</td>
<td>5 weeks</td>
<td>2 hours/week</td>
<td>2 hours/week</td>
<td>None</td>
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</tbody>
</table>
COURSE DESCRIPTIONS

Introduction to Databases; Introduction to Geodatabases; Database Management System Environments; Geographic Database Design; Database Design Tools; Database Models; Database Integration; Geodatabase Application Development; Geographic Database Management; Recent Trends in Geographic Database Design and Management

Prerequisite - CPSK 1102 (Introduction to Applied Programming) and GEOG 2102 (Mapping and GIS) or GEOG 3101 (Mapping and GIS)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratories - 2 hours once per week = 26 hours

GEOG 3103 (Advanced Remote Sensing)
This course provides the student with a background in advanced remote sensing practices in relation to operational satellite oceanography. The course will be taught using modern equipment and methodologies, allowing the student to better understand the uses of remote sensing in the extraction of oceanographic parameters. It will combine both theoretical and practical methods to reach the major objectives of both course and program.

Multispectral Remote Sensing; Ocean Surface Phenomena; Atmospheric Properties and Radiative Transfer; The Atmosphere/ Ocean Interface; Ocean Color; Sea Surface Temperature (SST); Microwave Remote Sensing; Introduction to Radars; Scatterometer Observations; The Allimeter; Imaging Radars

Prerequisite - GEOG 3200 (Remote Sensing)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratory - 2 hours/week = 26 hours

GEOG 3104 (Advanced Remote Sensing)
This course provides the student with a background in advanced remote sensing practices in relation to operational satellite oceanography. The course will be taught using modern equipment and methodologies, allowing the student to better understand the uses of remote sensing in the extraction of oceanographic parameters. It will combine both theoretical and practical methods to reach the major objectives of both course and program.

Multispectral Remote Sensing; Bathymetric Remote Sensing; Photogrammetry; Ocean Surface Phenomena; Atmospheric Properties and Radiative Transfer; The Atmosphere/ Ocean Interface; Ocean Colour; Sea Surface Temperature (SST); Microwave Remote Sensing; Introduction to Radars; Scatterometer Observations; The Allimeter; Imaging Radars

Prerequisite - GEOG 2200 (Remote Sensing)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

GEOG 3200 (Remote Sensing)
This course will provide an introduction to remote sensing technologies, examining the electromagnetic spectrum, ocean remote sensing, multi-spectral remote sensing, and image analysis. It will review the principles of data processing and the use of remote sensing in the coastal and marine environmental areas.

Introduction to Remote Sensing (RS); Electro-Magnetic Radiation; Multi-spectral Remote Sensing; Acoustic Remote Sensing in Water; Image Processing and Data Validation

Prerequisite - GEOG 3101 (Mapping and GIS)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratory - 3 hours/week = 39 hours

GEOG 3201 (Advanced Surveying Practices)
This course will introduce the student to advanced surveying methods and specialized hydrographic techniques. Building on the students' knowledge of standard survey practices the student will learn the principles and practical applications of: advanced GPS techniques, acoustic and alternative positioning methods, laser scanning and optical laser hydrographic surveys.

Review of Positioning Concepts; Advanced GPS Positioning Techniques; Review of Acoustic Principles; Acoustic Positioning Applications; Alternative Positioning Methods; Light Detection And Ranging (LIDAR) Theory; Light Detection And Ranging (LIDAR) Applications; Future Positioning Methods

Prerequisite - GEOG 1301 (Surveying and GPS) or equivalent; OAMP 2000 (Underwater Acoustic Applications) or equivalent
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

GEOG 3202 (Web-based Mapping)
This course provides the student with an introduction to the theoretical, technical, and practical application of web-based mapping through the design, implementation, generation and dissemination of geospatial data on the World Wide Web. The course will be taught using modern equipment and methodologies, allowing the student to better understand the benefits and limitations associated with web-based information creation, evaluation and optimization of web-based mapping techniques and workflows.

Introduction to Web-based Mapping; Technical Aspects of Web-based Mapping Development Environments; Web Programming; Geospatial Web Services; Geospatial Mashups; Mobile GIS; Geoprotocols; Spatial Data Infrastructure and the Web 2.0; Recent Trends in Web-based Mapping

Prerequisite - GEOG 3102 (Geographic Database Design and Management)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

GEOG 3203 (Remote Sensing)
This course will provide the student with an introduction to the theoretical, technical and practical application of marine GIS and Nautical Charting technologies utilized in an ocean mapping perspective. These practices will focus on specific marine and nautical applications associated with marine data management and pertinent cartography utilized in the formal production of a marine product. The course will employ modern equipment and methodologies, allowing the student to better understand the benefits and limitations associated with this technology, from system deployment and data acquisition to data processing, analysis and dissemination.

Marine GIS and Nautical Cartography; Fundamentals of Marine GIS; Fundamentals of Nautical Cartography; Applications in Industrial Engineering for Survey Chart Production; Applications and Future Trends in Marine GIS and Nautical Cartography

Prerequisite - GEOG 2102 (Mapping and GIS)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

GEOG 3401 (Nautical Chart Production)
This course provides the student with an introduction to the theoretical, technical and practical application of paper and electronic navigational chart production techniques and best practices. The course will be taught using high-level equipment and methodologies, allowing the student to better understand the benefits and limitations associated with this technology from a compilation, production, dissemination and management perspective.

Introduction to Nautical Charts; Fundamentals of Nautical Charts; Paper Nautical Chart Production; Electronic Navigational Chart Production; Nautical Chart Corrections; Nautical Chart Data Management; Future Trends in Nautical Chart Production

Prerequisite - GEOG 3102 (Geographic Database Design and Management)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 3 hours once per week for 10 weeks (starting in week 2) = 30 total hours

GEOG 3402 (Nautical Chart Production)
This course provides the student with an introduction to the theoretical, technical and practical application of paper and electronic navigational chart production techniques and best practices. The course is delivered using high-level equipment and methodologies, allowing the student to better understand the benefits and limitations associated with this technology from a compilation, production, dissemination and management perspective.

Introduction to Nautical Charts; Fundamentals of Nautical Charts; Paper Nautical Chart Production; Electronic Navigational Chart Production; Nautical Chart Corrections; Nautical Chart Data Management; Future Trends in Nautical Chart Production

Prerequisite - GEOG 3102 (Geographic Database Design and Management)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

GEOG 4103 (Aquatic Systems)
This course is an introductory course covering the fundamentals of hydrology, oceanography and limnology and will provide the student with an understanding of the processes and applications of each discipline.

Introduction to Water Resources; Runoff; Groundwater; Evaporation and Transpiration; Streamflow; Anthropogenic Case Studies

Lectures - 39 hours (3 hours per week)
Laboratories - 26 hours (2 hour lab per week)

GEOG 4200 (Geographic Information Systems)
This course is designed to provide the participants with an introduction to general map use and application as well as outline of the opportunities and limitations of the use of Geographic Information Systems (GIS) in the fields of Water Quality and Integrated Coastal and Ocean Management. Background to Maps, Digital Mapping Data Models, Geographic Information System; Basic Functions of GIS; Data Quality Evaluation; Recent Trends in GIS

Prerequisite - None
Duration - 13 weeks
Lectures - 3 hours/week = 39 total hours
Practical Exercises/Laboratories - 3 hours/week = 39 total hours

GEOG 4300 (Applied GIS and Remote Sensing)
This course is designed to provide the participants with hands on application of data collection and analysis of remote sensing and Geographic Information Systems (GIS) data in various projects directly related to integrated coastal and ocean management. Coastal and Ocean Management Case Studies; Data Requirements of Problem Resolution; Flow Charting Existing Problems and Development of Applicable Work Flow Models

Prerequisite - GEOG 3102 (Geographic Database Design and Management)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week for 10 weeks (starting in week 2) = 30 total hours

GEOG 4100 (Remote Sensing)
This course will provide an introduction to remote sensing technologies, examining data collection and processing methodologies. It will review the principles of data processing and the use of remote sensing in coastal zone and water quality problems.

Introduction to Remote Sensing (RS); Airborne Systems; Space Based Platforms; RADArs; Data Acquisition and Analysis; Underwater Acoustic Technologies; Applications

Prerequisite - None
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 3 hours/week

GEOG 3102 (Geographic Information Systems)
This course will provide the student with an introduction to geographic information systems (GIS) in various projects directly related to integrated coastal and ocean management. Geographic Information Systems (GIS) data in various projects directly related to integrated coastal and ocean management. Coastal and Ocean Management Case Studies; Data Requirements of Problem Resolution; Flow Charting Existing Problems and Development of Applicable Work Flow Models

Prerequisite - GEOG 3102 (Geographic Database Design and Management)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week for 10 weeks (starting in week 2) = 30 total hours

GEOG 3101 (Mapping and GIS)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours
COURSE DESCRIPTIONS

**Prerequisite** - GEOG 4100 (Remote Sensing); GEOG 4200 (Geographic Information Systems)
**Duration** - 5 weeks
**Lectures** - None
**Laboratory** - 4 hours/week (Two 2-hour labs/week)

**MARP 0002** (General Fishing Vessel Maintenance
This course is designed to give students basic knowledge and necessary skills to maintain their fishing vessel.

**Vessel Lay-up; Deck Equipment Maintenance Procedures; Engine Room Maintenance; Wheelhouse, Galley, and Accommodations Maintenance; Outboard Motor and Battery Maintenance; Engine / Shaft Alignment; Basic Hydraulic Systems and Maintenance; General Maintenance for Fishing Methods; General Maintenance Log Book**

**Pre-requisite** - None
**Duration** - 2 weeks (10 days)

**MATH 0102** (Mathematics)
This basic course is designed to help alleviate specific weaknesses in the student’s basic mathematical skills.

**Whole Numbers; Decimal Numbers; Fractions; Scientific Notation; Percentage; Linear Equations and Formula Manipulations; SI Units and Imperial Units**
**Duration** - 13 weeks
**Lectures** - 3 one-hour classes/week

**MATH 0103** (Mathematics)
This course is designed to ensure students have a solid foundation in basic mathematics and related concepts. Topics covered will assist students in better understanding concepts encountered in other courses.

**Whole Numbers; Decimal Fractions; Common Fractions; Percentages; Angular Measurement; Introduction to SI Units; Perimeters; Areas; Volumes; Practical Applications**
**Duration** - 10 weeks (30 hours)
**Lectures** - 3 hours/week

**MATH 0112** (Mathematics)
This is a course designed to ensure that students have a solid foundation in basic mathematics and related concepts. The topics covered will assist students to understand the technical material encountered in other courses.

**Whole Numbers; Common Fractions; Decimal Fractions; Percents; Ratio and Proportion; Angle Measure**
**Duration** - 13 weeks
**Lectures** - 2/0 hours per week

**MATH 0200** (Mathematics)
This introductory course is designed to strengthen the student's technical and mathematical skills and to enhance their problem solving ability; therefore, providing them with a solid foundation for a career as a marine mechanic.

**Applied Linear Measure; Applied Area Measure; Applied Volume and Surface Area; Ratio and Proportion; and Shop Formulas**
**Duration** - 13 weeks
**Lectures** - 3 hours/week

**MATH 0201** (Mathematics II)
This course is designed to strengthen technical and mathematical skills and to enhance problem-solving ability, thereby providing students with a solid foundation for a career in offshore steel fabrication.

**Linear Equations and Formula Manipulation; SI Units; Applied Linear Measure; Applied Angle Measure; Applied Volume and Surface Area Measure; Volume, Mass and Capacity Equivalences; Bending Metals**
**Pre-requisite** - MATH 0102 (Mathematics)
**Duration** - 13 weeks
**Lectures** - 3/0 hours per week

**MATH 1100** (Pre-Calculus)
This is a course in pre-calculus mathematics designed to help alleviate specific weaknesses in students’ mathematical skills and thereby increase their chances for success in other technical courses.

**Review of Fundamental Algebra; Trigonometric Functions; Operations Involving Algebraic Expressions; Operations Involving Fractional Algebraic Expressions Exponents and Radicals; The Quadratic Formula; Logarithms; Systems of Linear Equations and Determinants.**
**Pre-requisite** - None
**Duration** - 13 weeks
**Lectures** - 6 hours/week for a total of 78 hours

**MATH 1101** (Introduction to Calculus)
This is a course designed to prepare students for the study of calculus as well as to introduce them and give them a facility with the concepts of differentiation necessary for a better understanding of a variety of technology courses.

**Functions; Analytic Geometry; Trigonometry; Algebraic Operations and Complex Numbers; The Derivative**
**Pre-requisite** - MATH 1100 (Pre-Calculus) or Acceptable score on Mathematics Placement Test
**Duration** - 13 weeks
**Lectures** - 5 hours/week = 65 hours total

**MATH 1112** (NASC Mathematics I)
This is a course in pre-calculus mathematics designed to help alleviate specific weaknesses in students’ fundamental mathematical skills and thereby increase their chances for success in the Nautical Science technology program.

**Review of Fundamental Algebra; Trigonometry; Vectors; Operations Involving Algebraic Expressions; Quadratic Equations; Exponents and Radicals; Systems of Linear Equations; Analytic Geometry**
**Duration** - 13 weeks
**Lectures** - 6 hours/week for a total of 78 hours

**MATH 1200** (Calculus)
In this course students will study topics in differential calculus and will also be introduced to integral calculus. Topics covered will assist students to better understand concepts encountered in other courses.

**Curve Sketching; Transcendental Functions and Their Derivatives; Applications of the Derivative; Differentials; Introduction to Integration; The Definite Integral; Further Applications of Indefinite and Definite Integrals**
**Pre-requisite** - MATH 1101 (Introduction to Calculus) or MATH 1105 (Introduction to Calculus)
**Duration** - 13 weeks
**Lectures** - 5 hours/week = 65 hours total OR
**Duration** - 8 weeks
**Lectures** - 8 hours/week for a total of 64 hours
In the course students will study topics in differential calculus and this will also be introduced to integral calculus. Topics covered will assist students to better understand concepts encountered in other courses.

Curve Sketching; Transcendental Functions and Their Derivatives; Applications of the Derivative; Differentials; Introduction to Integration; The Definite Integral; Further Applications of Indefinite and Definite Integrals

Prerequisite - MATH 1101 (Introduction to Calculus) with a mark >60%, or MATH 1105 (Introduction to Calculus)

Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

**MATH 1212 (NASC Mathematics II)**

This is a course comprised of a variety of topics designed to meet specific needs of the Nautical Science Diploma Program.

Measure; Ratio, Proportion, and Linear Interpolation; Geometry; Moments and Centre of Gravity; Simpson's Rules; Trigonometric Graphs and Identities; Spherical Trigonometry; Statistics

Prerequisite - Successful completion of MATH 1111 or MATH 1112 (NASC Mathematics I)

Duration - 13 weeks
Lectures - 6 hours/week for a total of 78 hours

**MATH 2101 (Advanced Calculus)**

This is primarily an applied calculus course designed to meet the specific requirements of various technology and degree programs.

Integration Techniques; Applications of Integration; Double Integration; Differential Equations

Prerequisite - MATH 1200 (Calculus) equivalent
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

**MATH 2102 (Mathematics)**

This is a course comprised of a variety of topics designed to meet specific needs of the Nautical Science Diploma program.

Formula Manipulation; Measure; Geometric Construction; Interpolation; Moments; Trapezoidal Rule; Simpson's Rule; Spherical Trigonometry

Prerequisite - MATH 1100 (Pre-Calculus) or equivalent
Duration - 13 weeks
Lectures - 3 hours/week

**MATH 2203 (Linear Algebra)**

This is an introductory linear algebra course covering basic concepts including matrices, determinants, Euclidean and general vector spaces, eigenvalues and eigenvectors.

Systems of Linear Equations and Matrices; Determinants; Euclidean Vector Spaces; General Vector Spaces; Eigenvalues and Eigenvectors

Co-requisite - Math 1200 (Calculus)
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours total

**MATH 2204 (Spherical Trigonometry)**

This is a course in pre-calculus mathematics comprised of topics of spherical trigonometry which relate to navigation.

Terminology and Properties of Spherical Triangles; Oblique Spherical Triangles; Great Circle Sailing; Right Spherical Triangles and Quadrantal Spherical Triangles

Prerequisite - MATH 1100 (Pre-Calculus) or equivalent
Duration - 6 weeks
Class Hours - 4 hours per week = 24 total hours

**MECH 1100 (Mechanics)**

This course provides the fundamental concepts required for the analysis of basic engineering problems and builds on the principles introduced in previous physics courses. Students are introduced to elements of statics and dynamics appropriate for a first course for technicians studying marine engineering.

Analysis of Force Systems; Principal of Moments; Equilibrium; Analysis of Trusses and Machines; Friction; Centroids, Moments of Area, and Moments of Inertia; Kinematics of Rigid Bodies; Plane Motion; Kinetics of Rigid Bodies; Work, Power, and Energy; and Simple Machines

Prerequisite - MATH 1100 (Pre-Calculus) or MATH 1102; PHYS 1100 (Phys) or PHYS 1101 (Phys)
Duration - 13 weeks
Lectures - 4 hours/week
Labs - 2 hours/week every second week for 6 labs = 12 hours

**MECH 1101 (Mechanics)**

This course provides the fundamental concepts required for the analysis of basic engineering problems and builds on the principles introduced in previous physics courses. Students are introduced to elements of statics and dynamics appropriate for a first course for machinists studying marine engineering.

Statics of Forces; Principal of Moments; Equilibrium; Analysis of Force Systems; Principal of Moments; Kinematics of Rigid Bodies; Plane Motion; Kinetics of Rigid Bodies; Work, Power, and Energy; and Simple Machines

Prerequisite - MATH 1100 (Pre-Calculus) or MATH 1102; PHYS 1100 (Phys) or PHYS 1101 (Phys)
Duration - 13 weeks
Lectures - 4 hours/week
Labs - 2 hours/2 week period

**MECH 2100 (Machine Design)**

This course is an introduction to the primary considerations in the design of machines as they relate to each other, to their operators and to the environment. Machines will be seen as converters of energy and as the extension of human power. The composition and characteristics of machines will be presented and the underlying principles of mechanics of machines and strength of materials demonstrated, thus enabling the student to design machinery supplemented by practical manufacturing exposure and experience.

Nature and Composition of Machines: The Many Aspects of Machine Design; Design for Strength; Belt Drives and Band Brakes; Friction Clutches; Gear Drives; Cam Design; Detachable Fasteners; Springs

Prerequisites - MATH 1101 (Mechanics) or MATH 1100 (Mechanics); MTPR 2101 (Strength of Materials)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

**MECH 2102 (Mechanics)**

This is a foundation course that provides the fundamental concepts required for the understanding and development of basic engineering sciences, and builds on the principles developed in Physics 1100. This first course in mechanics concentrates on the all important concepts of statics.

Statics of Particles, Force Systems and Their Equivalents; Statics of Rigid Bodies; Rigid Bodies in Space; Centroids and Centres of Gravity; Analysis of Frames and Machines; Friction; Second Moments of Area and Moments of Inertia

Prerequisite - PHYS 1100 (Phys); MATH 1100 (Mathematics)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

**MECH 2110 (Mechanics)**

This is a foundation course that provides the fundamental concepts required for the understanding and development of basic engineering sciences, and builds on the principles developed in PHYS 1100 (Physics). This first course in mechanics concentrates on the all important concepts of statics.

Statics of Particles, Force Systems and Their Equivalents; Statics of Rigid Bodies; Rigid Bodies in Space; Centroids and Centres of Gravity; Analysis of Frames and Machines; Friction; Second Moments of Area and Moments of Inertia

Prerequisite - PHYS 1100 (Physics); MATH 1100 (Mathematics)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

**MECH 2111 (Statics and Dynamics)**

This course provides the fundamental concepts required for the analysis of basic engineering problems and builds on the principles introduced in previous physics courses. Students are introduced to elements of statics and dynamics appropriate for a first course for technicians studying marine engineering.

Analysis of Force Systems; Principle of Moments; Equilibrium; Friction; Centroids, Moments of Area, and Moments of Inertia; Kinematics of Rigid Bodies; Plane Motion; Kinetics of Rigid Bodies; Work, Power, and Energy

Prerequisite - MATH 1105 (Introduction to Calculus); PHYS 1103 (Physics)
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours
Laboratories - 2 hours/week every second week for a total of 6 labs = 12 hours

**MECH 2201 (Mechanics)**

This second course in mechanics introduces the fundamental concepts of dynamics and builds on the basic principles of statics presented in Mechanics 2102. The two course sequence is a basic requirement for the analysis of engineering problems, and for understanding the design principles of various machines and mechanisms.

Dynamics of Particles; Dynamics of Rigid Bodies; Mechanical Vibrations

Prerequisite for students prior to September 2004 - MECH 2102
Prerequisite for students as of September 2004 - MECH 2110
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 6 experiments

**MECH 2207 (Theory of Machines)**

This course develops and expands the principles and theories of basic engineering mechanics and looks at the application of these principles to specific machine elements.

Velocity and Acceleration Diagrams; Balancing of Rotating Masses; Gear Drives; Vibrations; Special Topics in Machines

Prerequisite - MECH 2111 (Statics and Dynamics); MTPR 1300 (Materials and Processes); MATH 1201 (Calculus)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratories - 2 hours/week every second week for a total of 6 labs = 12 hours
Total - 51 hours

**MECH 3100 (Theory of Machines)**

This course develops and expands the principles and theories of basic engineering mechanics which are necessary for the design and understanding of various common mechanisms for standard mechanical engineering applications.

Velocity and Acceleration Diagrams; Crank and Effort Diagrams and Flywheel Design; Governors; Balancing of Rotating Masses; Gyroscoops; Belt Drives and Band Brakes; Friction Clutches; Gear Drives; Cam Design; Transverse Vibration of Beams; Whirling of Shafts

Prerequisite for students prior to September 2004 - MECH 2201 (Mechanics)
Co-requisite for students prior to September 2004 - MECH 2101 (Mathematics)
Prerequisite for students as of September 2004 - MECH 2201 (Mechanics)
MENV 2100 (Marine Environment)
This is an introductory course to environmental science and some of the major environmental issues. Emphasis is placed on causes and effects of marine pollutants.

Environmental Citizenship; Major Environmental Issues; Ocean Users and Uses; Marine Pollution; and Case Studies
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 6 experiments

MENV 2101 (Dynamics of Marine Pollution)
This is an introductory course of the mechanisms involved in the movement of pollutants in the marine environment. This includes oil and chemical spills and also the spread of pollution from land based sources.
Properties; Priority Pollutants; Spill Behaviour in the Marine Environment; Environmental Factors; Introduction to Pollution Response; Effluent Plume Dispersion; Limnology; Open Channel Flow; Offshore Exploration and Production (Oil and Gas)
Prerequisite - CHEM 1100 (Chemistry) or CHEM 1101 (General Chemistry I)
Duration - 13 weeks
Lectures - 39 hours (3 hours/week)

MENV 2102 (Marine Sampling)
This course will provide the students with the practical skills necessary to plan and conduct a basic marine sampling program. The course is one week in duration and will be delivered through a series of laboratories and practical exercises. Students will spend 1.5 days going through sampling procedures at sea, 1.5 days performing biological analysis of specimens and two days looking at cruise planning and equipment care and maintenance. Students will document all field work in a journal which will be submitted for evaluation.
Introduction to Marine Sampling; Basic Sampling Tools; Cruise Planning; Oceanographic Sampling; Environmental Observations; and Biological Sampling
Prerequisites - BIOL 1100 (Biology); CHEM 1200 (Chemistry) or CHEM 1201 (General Chemistry I)
Duration - 5 days

MENV 2103 (BASIC OIL SPILL RESPONDER)
This is an entry-level course that will provide participants with basic knowledge and skills in oil spill response. Canada Shipping Act: Marine Oil Spill Response Capability; Basic Properties of Petroleum & its Hazards; Personal, Site & Equipment Safety; Oil Spill Containment and Protection Techniques; Introduction to Spill Behavior; Introduction to Spill Assessment; Sampling; Recovery Techniques & Systems; Sorbents; Transfer, Storage & Disposal; Shoreline Cleanup Techniques; Oiled Wildlife Recovery & Treatment; Public Relations.
Duration - 35 hours
Theory - 20 hours
Practical - 15 hours

MENV 2300 (Environmental Applications of Industrial Hygiene)
This course is designed to familiarize participants with the principles and techniques involved in industrial hygiene practices. Defining Industrial Hygiene; Indoor Environmental Investigation; Ventilation; Defining Workplace Hazards; Source Control; Defining Workplace Ambiance; Legislative Authorities Controls; Investigating Workplace Complaints
Duration - 13 weeks
Lectures - 2 hours per week = 26 total hours

MENV 2301 (Fisheries Conservation Technologies)
An introduction to global marine fisheries, fisheries management and conservation measures in fisheries.
Global Fisheries; Managing Fisheries; Domestic Regulatory Framework; Fisheries Impacts; Fisheries Conservation
Duration - 13 weeks
Lecture - 3 hours/week = 39 hours total

MENV 3101 (Marine Environmental Seminar)
This course will present selected topics of relevance to the marine environment as well as land based pollution sources. The format will consist of presentations by faculty and invited speakers.
Air Pollution; Solid Waste Management; Pollution Control; Marine Protected Areas; Pollution Cleanup Technology; Environmental Policy; Environmental Biology; Environmental Assessment and Audit; and Bioremediation
Duration - 13 weeks
Lectures - 3 hours/week

MENV 3102 (Fundamentals of Coastal Zone Management)
This course is designed to familiarize participants with the multidisciplinary nature of the elements involved in Coastal Zone Management and the complexity of their interactions. It will also provide an overall review of the program rational, particularly the three phases: description, analysis and synthesis that constitute the basis for the Coastal Zone Management Program.
Land/Ocean/Atmosphere Interface; Coastal Ecosystems; Production Economy; Social Ecology; Coastal Technologies; Environmental Hazards; Multiple User Conflicts; Legal Issues; and Integrated Coastal Zone Management
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4100 (Introduction to Coastal Zone Management)
This course is designed to familiarize participants with the multidisciplinary nature of the elements involved in CZM and the complexity of their interactions. It will also provide an overview of the program rational, particularly the three phases: description, analysis and synthesis that constitute the basis for CZM.
Introduction to the Coastal Zone; The Coastal Systems; Coastal Zone Protection; Development in Coastal Zone; Environmental Hazards; Multiple User Conflict; Integrated Coastal Zone Management; Conceptual Framework for Integrated Coastal Zone Management; Coastal Zone Management Programs
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4101 (Marine Environmental Seminar)
This course will present selected topics of relevance to the marine environment as well as land based pollution sources. The format will consist of presentations by faculty and invited speakers.
Air Pollution; Solid Waste Management; Pollution Control; Marine Protected Areas; Pollution Cleanup Technology; Environmental Policy; Environmental Biology; Environmental Assessment and Audit; and Bioremediation
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4102 (Fundamentals of Coastal Zone Management)
This course is designed to familiarize participants with the multidisciplinary nature of the elements involved in Coastal Zone Management and the complexity of their interactions. It will also provide an overall review of the program rational, particularly the three phases: description, analysis and synthesis that constitute the basis for the Coastal Zone Management Program.
Land/Ocean/Atmosphere Interface; Coastal Ecosystems; Production Economy; Social Ecology; Coastal Technologies; Environmental Hazards; Multiple User Conflicts; Legal Issues; and Integrated Coastal Zone Management
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4103 (Human Ecology)
This course provides the conceptual background on social aspects that will be utilized in the Conflict Resolution and Resource Management courses. It is designed for coastal managers who are involved in community resource development. The course will provide an overview of human interactions from the individual, the family and the community. Historic and cultural resource exploitation in the coastal area is examined.
The Individual; Group Dynamics; Societal Structures; Institutions and Governance; Ethics and Culture; Managing Coastal Areas
Duration - 13 weeks
Lectures - 39 hours (3 hours/week)

MENV 4107 (Introduction to Integrated Coastal and Ocean Management)
This course is designed to familiarize participants with the multidisciplinary nature of the elements involved in Integrated Coastal and Ocean Management (ICOM) and the complexity of their interactions. It will also provide an overview of the program rational, particularly the three phases: description, analysis and synthesis, which constitute the basis for ICOM.
Introduction to the Coastal Zone; The Basic Principles of Integrated Coastal and Ocean Management; The Global Growth and Evolution of Integrated Coastal and Ocean Management; Development in the Coastal Zone; Conceptual Framework for Integrated Coastal and Ocean Management; Integrated Coastal and Ocean Management of Marine Ecosystems; Integrated Coastal and Ocean Management Programs
Duration - 39 hours
Lectures - 3 hours per week
MENV 4200 (Environmental Management)
This course will elaborate on the conceptual elements described in the basic course Coastal Resources and Coastal Resource Management to provide the participants with an overall view of the methods used to assess the status of the coastal environment and the impact of Man activities on the natural environment. It will also review examples of environmental legislation and protective measures.

Environmental Carrying Capacity; Environmental Impact Assessment; UNCED-Agenda 21 Framework; Contemporary Acknowledge and Trends in Environmental Quality; Effectiveness and Adequacy of Environmental Protection Measures; The Role of GESAMP

Prerequisites - MENV 4105 (Coastal Resources)
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4201 (Coastal Resource Management)
This is an intermediate level course designed to introduce participants to the conceptual elements involved in Resource Management. The course discusses the types of resources available in the CZ, the different levels of management, private and public use of resources, and difficulties involved in establishing management policies in a multi-sectoral environment. It will also review the methodology for resource surveys and assessments, and resource value and management options through review of practical examples.

Type of Coastal Resources; Elements of Coastal Resource Management; Historical Overview of Managing Coastal Resources; Protecting the Coastal Environment; Development and Coastal Resource Management; Legal Aspect of Managing Coastal Resources; Interdisciplinary Tools for Resolving Coastal Conflicts; Managing Coastal Resources

Prerequisites - ONGR 4101 (Coastal Oceanography and Geomorphology); MENV 4105 (Coastal Resources)
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4202 (Coastal Resources Management)
This intermediate level course is designed to introduce students with the conceptual elements of resource management of coastal resources. The course discusses the tenets of sustainability and the human impact on the environmental through use and extraction. Stakeholder concerns and management approaches are examined through case studies of management approaches and plans.

Defining Coastal Areas; Coastal Management Use and Issues; Sustainability Tenets; Concepts of Coastal Planning and Management; Management Fundamentals; Technical Issues; Interdisciplinary Tools for Resolving Coastal Conflicts; Case Studies

Prerequisites - MENV 4105 (Coastal Resources)
Duration - 13 weeks
Lecture - 3 hours/week = 39 hours

MENV 4203 (Marine Ecotourism)
This course is designed to give students an overview of the demand for coastal ecotourism products, the implications of this demand on the marine environment and the effects on coastal communities.

The Tourism Industry; Ethics and Sustainability; Ecotourism Development; Integrated Coastal Management (ICM) and Strategic Planning

Duration - 13 weeks
Lecture - 3 hours per week = 39 total hours

MENV 4301 (Ocean Research Technology)
This course will provide an overview of some of the technologies currently being employed in the field of ocean research by the Centre of Sustainable Aquatic Resources (C-SAR) at the Marine Institute. Researchers will discuss how these technologies can be employed in relation to course material covered in the Advanced Diploma in Integrated Coastal and Ocean Management Program. Research Technologies at C-SAR; Industry Needs and Research Technology Development; Current Topics in Ocean Research

Prerequisites - Successful completion of Term 1 and Term 2.
TERM 1 - BSMG 4109 (Coastal Economics); GEG 4110 (Remote Sensing); MENV 4105 (Coastal Resources); MENV 4106 (Human Ecology); MENV 4107 (Introduction to Integrated Coastal and Ocean Management); ONGR 4104 (Coastal Oceanography and Climatology)
TERM 2 - BSMG 4106 (Legal Aspects of Coastal Zone Management); BSMG 4107 (Conflict Resolution Skills); GEG 4110 (Geographic Information Systems); MENV 4200 (Environmental Management); MENV 4202 (Coastal Resource Management); STAT 4102 (Statistics for Coastal Zone Management)
Duration - 1 week

MENV 4302 (Fisheries Management and Development)
This course will provide students with general knowledge of fishing methods and harvesting techniques. It has been developed to enhance students’ understanding of the impact that fishing has on both the resource and the ocean environment and help them gain insight into future trends in fisheries management and development. Introduction and Harvesting Overview; Fishing Methods; Fish Biology and Behaviour; Fishing Gear Technology; Scientific Methodology and Harvesting; Allocation and Regulations; Future Trends

Duration - 13 weeks
Lectures - 3 hours/week

MENV 4303 (Current Topics in Ocean Research Technology)
This course will provide an overview of a variety of technologies currently being employed in the field of ocean research.

Flume Tank Applications; Current Research in Sustainable Fisheries Technologies; Remotely Operated Vehicles (ROVs); Trawl Monitoring Systems; Acoustic Research Applications

Prerequisites - Successful completion of Terms 1 and 2.
Duration - 1 week

MIPG 4103 (Technical Problem Solving)
This course is designed to provide participants with various creative problem-solving techniques that are used to analyze and solve technical problems that occur in industry. It fosters both the use of creativity and technical knowledge to increase an individual’s problem solving skills.

Problem Solving and People; Problem Definition; Generating Ideas and Solutions; Decision Making; Implementation Evaluation; Crisis Management and Crisis Leadership

Schedule - Web-based instruction (39 hrs total)

MIPG 4104 (Quality Assurance in the Food Industry)
This course is designed to provide participants with an understanding of the various elements necessary in the design and implementation of a quality assurance program for the food industry.

Quality and the Food Industry; Quality Assurance Program; Specifications; Raw Material/Ingredient Supplier Certification; Process Control; Product Quality Audits; Third-party Audit; Standards and Certification; Quality Assurance Documentation System

Schedule - Web-based instruction 39 hours (3 hours per week)

MIPG 4113 (Introduction to Food Safety)
This course will introduce students to the fundamental control measures required to produce safe food as well as an overview of food safety regulation, food microbiology, food toxicology and an introduction to the safety of genetically modified foods.

Fundamentals of Food Safety; Food Microbiology and Food Safety; Food Toxicology and Food Safety; Genetically Engineered Foods and Food Safety

Prerequisites - None
Schedule - Web-based instruction: 39 hours

MIPG 4114 (Fundamentals of Canadian Food Laws and Regulations)
This course is designed to introduce the major topics in Canadian food laws and regulations that are fundamental in the manufacturing and trade of safe and compliant food commodities. While Canadian food laws and regulations are the primary focus of this course, some international food laws and regulations will also be introduced.

Introduction to Canadian Legal System; Canadian Food Inspection Agency (CFIA); Federal Food Acts and Regulations; Additional Federal Departments and Agencies; Provincial Food Laws and Regulations; International Food Laws and Regulations; Genetically Engineered (GE) Food

Schedule - Web-based instruction (39 hrs total)

MIPG 4115 (Foodborne Illness and Food Toxicology)
This course is designed to enable the student to gain knowledge of the biological and chemical hazards present in foods and their effect on human health.

Principles of Food Toxicology; Biotransformations; Chemical Carcinogenesis; Natural Toxins in Animal Foodstuffs; Toxic Photocharacters; Environmental Toxins; Animal Drug Residues; Food Additives; Toxics formed during Food Processing; Important facts of Foodborne Diseases; Foodborne intoxications; Foodborne Infections; Foodborne Toxiconfections; Parasites and Algal Toxins; Food Insensitivities

Schedule - Web-based instruction (39 hrs total)

MIPG 4116 (Food Hygiene and Food Safety)
This course is designed to introduce students to the various aspects of food sanitation and to provide students the necessary tools to design, and implement an effective sanitation program.

Introduction; Regulations and Buyer Drive Program Affecting Food Sanitation; Microbiology; The Control of Microorganisms; Cleaning and Sanitization Practices; Pest Control; Industry Specific Sanitation Considerations; Elements of an Effective Environmental Management Program; Facility Design; Maintenance and Construction

Prerequisites - None
Schedule - Web-based instruction: 39 hours

MRK 0101 (Marine Engineering Knowledge)
This introductory course will provide students with the necessary knowledge and skill to gain employment in a marine related/mechanically oriented field, and through continued studies, to obtain a marine engineer’s certificate.

Safety; Introduction to Basic Hand Tools; Introduction to Combustion Engines (Gasoline); Engine Systems; Introduction to Diesel Engines; Diesel Engine Fuel Injection Systems; Governors; and Supercharging

Duration - 16 weeks
Lectures - 12 hours/week
Laboratories - 10 hours/week

MRK 0102 (Marine Engineering Knowledge)
This introductory course will provide students with the necessary knowledge and skill to gain employment in a marine related/mechanically oriented field, and through continued studies, to obtain a marine engineer’s certificate.

Safety; Introduction to Combustion Engines; Engine Systems; Diesel Engine Fuel Supply, Fuel Injection and Governing Systems
Course Descriptions

MREK 2020 (Marine Engineering Knowledge)
This advanced course will provide students with the necessary knowledge and skills to gain employment in a marine related/mechanically oriented field, and through continued studies, to obtain a marine engineer's certificate.

Marine Diesel Engine Systems; Pumps and Pumping Systems; Boilers; Air Compressors; Purifiers; Bilge, Ballast Systems and Oil Pollution; Shafting; Propellers and Propulsion; Alignment; Steering Gear; Hydraulics; Refrigeration; Watchkeeping

Prerequisite - MREK 0101 (Marine Engineering Knowledge)
Duration - 13 weeks
Lectures - 6 hours/week
Laboratories - 6 hours/week

MREK 2021 (Ship Stability and Construction)
This introductory course will provide students with a basic knowledge with the principles of ship stability and construction.

Ship Stability; Ship Construction

Duration - 13 weeks
Lectures - 3 hours/week

MREK 1101 (Marine Engineering Knowledge I)
This course is designed to introduce students to the design, operation, and application of marine diesel engines.

Marine Diesel Engine Terminology; Diesel Engine Stationary Parts; Diesel Engine Moving Parts; Lubrication; Fuel Systems; Cooling Systems; Starting Systems; Charge Air and Exhaust Systems; Marine Propulsion Plants

Duration - 13 weeks
Lectures - 6 hours/week = 65 hours total
Laboratories - 2 hours/week = 26 hours total

MREK 1201 (Marine Engineering Knowledge II)
This second course in Marine Engineering knowledge is designed to provide the student with knowledge of ship auxiliary equipment and shipboard systems.

Pumps and Pumping Systems; Ballast Systems; Seawater Cooling Systems; Fuel Handling System; Bilge Water Handling System; Compressed Air System; Steering Gear; Steam Boilers and Steam Plants

Prerequisites - MREK 1101 (Marine Engineering Knowledge I)
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total
Laboratories - 2 hours/week = 26 hours total

MREK 2101 (Marine Engineering Knowledge I)
This is the introductory course designed to give students in the Naval Architecture program knowledge of propulsion systems and their components.

Fasteners; Piping Material; Specifications, Connections and Hangers; Valves and Cocks; Fuels and Properties; Pumps; Compressors; Bilge System; Ballast System; Fuel Oil System; Seawater Systems; Freshwater System; Compressed Air System. Lubricating Oil System

Prerequisites - CHEM 1100 (Chemistry)
Co-requisites - NARC 1104 (Steel Ship Structure); MECU 2102 (Mechanics); MATH 1101 (Introduction to Calculus)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories/Projects - 2 hours/week every other week = 12 hours total

MREK 2102 (Marine Engineering Knowledge II)
This is a marine engineering course designed to give the students knowledge and understanding of the basic operational principles of ships' machinery.

Fuels; Instrumentation and Controls; Valves; Pumps and Pumping Stations; Steam Boilers

Prerequisite - NASC 1204 (Seamanship II)
Duration - 13 weeks
Lectures - 3 hours/week

MREK 2103 (Marine Engineering Knowledge III)
The course is designed to give students in Marine Engineering a working knowledge of internal combustion engines which can be applied to their operation and maintenance.

Fuels; Power Plants; Diesel Engine Classification and Stationary Parts; Diesel Engine Moving Parts; Trailing Edge and Engine Lubricating; Engine Power and Fuel Consumption; Intake and Exhaust Systems; Fuel Burning Systems; Cooling Systems; Governing

Duration - 13 weeks
Lectures - 5 hours/week
Laboratories - 1 hour/week

MREK 2107 (Marine Engineering Knowledge IV)
This is the first course in marine engineering knowledge designed to give the student an understanding of marine terminology, propulsion equipment, shipboard systems, marine pollution and an engineer’s duties.

Marine Living; Marine Terminology; Main Propulsion Machinery (Diesel Engines); Marine Auxiliary Machinery; Steam Boilers and Steam Plants; Power Plants; Bilge, Ballast Systems, and Oil Pollution; Engineer’s Duties

Duration - 13 weeks
Lectures - 5 hours/week

MREK 2110 (Marine Engineering Knowledge V)
This is the first course in marine engineering knowledge, designed to prepare students for their first workterm by providing knowledge of propulsion equipment and shipboard systems.

Marine Diesel Engines; Steam Boilers and Steam Plants; Marine Propulsion Plants

Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

MREK 21111 (Marine Engineering Knowledge VI)
This is the third of seven courses in marine engineering knowledge. It is designed to provide the student with knowledge of ship auxiliary equipment and shipboard systems.

Heat Exchangers; Freshwater Systems; Evaporators and Reverse Osmosis; Sewage Systems and Incinerators; Deck Machinery; Fire Prevention Systems, Regulations, and Safety; Watertight Doors; Propulsion Systems; Vibration

Prerequisite - MREK 1201 (Marine Engineering Knowledge II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 1 hour/week = 13 hours total

MREK 2112 (Marine Engineering Knowledge VII)
This marine engineering course is designed to give students knowledge and understanding of the basic operational principles of ship machinery.

Fuels; Instrumentation and Controls; Valves; Pumps and Pumping Systems; Sewage Treatment Plants; Steam Boilers; Fresh Water Production; Materials and Corrosion Prevention

Prerequisite - NASC 1204 (Seamanship II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

MREK 2201 (Marine Engineering Knowledge VIII)
The course is designed to give Naval Architecture students more knowledge of Marine Engineering Systems and basic knowledge of Power Plant components.

Shafting Arrangements; Prime Movers; Steam Generation and Systems; Exhaust Gas Systems; Engine Room Ventilation; Fire Fighting Systems; Domestic Sanitary Systems; Hull Machinery

Prerequisite - MREK 2101 (Marine Engineering Knowledge I)
Duration - 13 weeks
Lecture - 6 hours/week = 30 hours total
Laboratory - 4 hours/week = 20 hours total

MREK 2202 (Marine Engineering Knowledge IX)
This is a marine engineering course designed to give the student's knowledge and understanding of the basic operational principles of ship's machinery.

Internal Combustion Engines; Steam Turbines; Propulsion Systems; Steering Gears; Tank Level and Draft Measurement; and Deck Machinery Layout

Prerequisite - MREK 2102 (Marine Engineering Knowledge II)
Duration - 13 weeks
Lectures - 3 hours/week

MREK 2203 (Marine Engineering Knowledge X)
This course is designed to give Marine Engineering students knowledge of auxiliary systems and equipment that can be applied to their operation and maintenance.

Steam Boilers and Steam Plants; Pumps; Air Compressors and Systems; Coolers and Cooling Systems; Windlass; Bilge, Ballast Systems and Oil Pollution; Sewage Plant and Pollution; Steering Gears; and Fuel Oil Preparation and Burning Systems

Prerequisite - MREK 2103 (Marine Engineering Knowledge III)
Duration - 13 weeks
Lecture - 3 hours/week
Laboratories - 2 hours/week

MREK 2207 (Marine Engineering Knowledge XI)
This course is designed for the marine engineering student who has completed the first work term. This course will provide the student with the concepts of internal combustion engines and associated subsystems. It is offered using the Propulsion Plant Simulator (PPS) and Diesel/Fitting Shops for the application of theory as well as providing the student with the requirements for the Level 1 PPS course.

Diesel Engine Cooling Water Systems; Diesel Engine Liner and Jacket Water-cooled Systems; Piston and Piston Cooling; Intake and Exhaust Systems; Air Compressors and Systems; Diesel Engine Starting Systems; Diesel Engine Lubrication; Crankcase Explosions, and Scavenge Fires; Pumps; Fuel Burning Systems; Waste Heat Recovery Systems; Fresh Water Generation and Treatment

Prerequisite - MREK 2107 (Marine Engineering); WKT 1103 (Work Term 1: Marine Engineering)
Duration - 13 weeks
Lectures - 8 hours/week

MREK 2208 (Marine Engineering Knowledge XII)
This is the second course in marine engineering knowledge designed to prepare students for their first workterm by providing knowledge of ship auxiliary equipment and shipboard systems.

Marine Auxiliary Equipment; Bilge, Ballast and Fuel Handling Systems

Prerequisite - MREK 2110 (Marine Engineering Knowledge I)
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

MREK 2209 (Marine Engineering Knowledge XIII)
This course will provide the student with an in-depth understanding of internal combustion engine concepts and associated systems.

Diesel Engine Cooling Water Systems; Diesel Engine Liner and Jacket Water-cooled Systems; Piston and Piston Cooling; Intake and Exhaust Systems; Diesel Engine Starting Systems; Diesel Engine Lubrication, Crankcase Explosions, and Scavenge Fires; Pumps; Governors; Diesel Plant Control

Prerequisite - MREK 2111 (Marine Engineering Knowledge III)
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total
Laboratories - 2 hours/week = 26 hours total
MREK 2212 (Marine Engineering Knowledge II)
This marine engineering course is designed to give students knowledge and understanding of the basic operational principles of ship's machinery.

- Internal Combustion Engines: Steam Turbines; Gas Turbines; Propulsion Systems; Steering Gears and Stabilizers; Hydraulic Systems; Deck Machinery; Shipboard Electrical Production and Distribution
- Prerequisite: MREK 2112 (Marine Engineering Knowledge I)
- SLTK 1203 (Basic Electrical Technology)
- Duration: 13 weeks
- Lectures: 3 hours/week = 39 hours total

MREK 3102 (Marine Engineering Knowledge)
This is a marine engineering course designed to give students a knowledge and understanding of the basic operational principles of ship's machinery.

- Cargo Piping and Pumps; Refrigeration; Vibration; Venturi Systems; Engine Power, Propeller Pitch, and Power
- Prerequisite: MREK 2202 (Marine Engineering Knowledge II)
- Duration: 13 weeks
- Lectures: 3 hours/week

MREK 3103 (Marine Engineering Knowledge)
This course is designed to give the student the knowledge of design considerations for internal combustion engines suitable for marine applications whereby the student will be able to diagnose machinery problems.

- Fuel Treatment; Valve Timing and Gas Exchange Processes; Fuel Injection Systems; Diesel Engine Liner and Jacket Water-Cooled Systems; Piston and Piston Cooling Systems; Diesel Engine Lubrication, Crankcase Explosions, and Scavenging Fires; Diesel Engine Starting Systems; Bearing Design; Reduction Gears and Couplings; Intermediate Shifting and Thrust Block.
- Prerequisite: MREK 2203 (Marine Engineering Knowledge II)
- Duration: 13 weeks
- Lectures: 5 hours/week
- Laboratories: 1 hour/week

MREK 3104 (Marine Engineering Knowledge)
This course is designed to develop students' ability to understand an internal combustion engine's fuel/governing system and to determine power developed. It will also lead students in a study of reduction gearing, main shafting, controlable pitch propellers and steering gears.

- Fuel Treatment; Valve Timing and Gas Exchange Process; Fuel Injection Systems; Engine Power and Fuel Consumption; Governors; Bearing Design; Reduction Gears and Couplings; Intermediate Shifting and Thrust Block; Stern Tubes and CP Propellers; Steering Gears
- Prerequisite: MREK 2207 (Marine Engineering Knowledge)
- Duration: 13 weeks
- Lectures: 4 hours/week

MREK 3105 (Marine Engineering Knowledge III)
This course will provide the student with more in-depth understanding of internal combustion engine concepts and associated systems.

- Diesel Engine Cooling Water Systems; Diesel Engine Liner and Jacket Water-Cooled Systems; Piston and Piston Cooling; Intake and Exhaust Systems; Air Compressors and Systems; Diesel Engine Starting Systems; Diesel Engine Lubrication, Crankcase Explosions, and Scavenging Fires; Fuels; Fuel Handling & Storage; Fuel Burning Systems; Governors.
- Prerequisite: MREK 2208 (Marine Engineering Knowledge II)
- Duration: 13 weeks
- Lectures: 5 hours/week = 65 hours total

MREK 3107 (Marine Engineering Knowledge V)
This course is designed to provide the student with the fundamental knowledge and air conditioning relative to shipboard systems.

- Refrigeration Cycles; Refrigerants and Refrigerant Properties; Component Analysis; System Operation and Maintenance; Refrigeration Processes; System Analysis; Psychrometry; Air Conditioning and Ventilation; Carriage of Refrigerated Cargo by Ships; Safety
- Prerequisite: MREK 2209 (Marine Engineering Knowledge IV); TMRK 2105 (Ship Technology)
- Duration: 13 weeks
- Lecture: 5 hours/week = 65 hours
- Laboratories: 2 hours/week = 26 hours

MREK 3112 (Marine Engineering Knowledge III)
This marine engineering course gives students knowledge and understanding of the basic operational principles of ship's machinery.

- Fire Detection and Extinguishing Systems; Refrigeration; Vibration; Systems on Vessels Operating in Ice; Engine Power, Propeller Pitch, and Power; Engineering Watch and Safety Practices; Tank Level and Draft Measurement
- Prerequisite: MREK 2212 (Marine Engineering Knowledge II)
- Duration: 13 weeks
- Lectures: 3 hours/week = 39 hours total

MREK 3201 (Marine Engineering Knowledge)
This is an intermediate level course designed to give five students in Marine Engineering a working knowledge of gas turbines which can be applied to their operation and maintenance.

- Gas Turbine Types and Classification; Principle of Operation; Structure of Gas Turbines; Gas Turbine Systems; Reduction Gearing for Gas Turbine Installations; Operation and Monitoring; Overview of Naval Gas Turbines
- Prerequisite: MREK 2203 (Marine Engineering Knowledge)
- Duration: 13 weeks
- Lecture: 3 hours/week
- Laboratories: 2 hours/week

MREK 3202 (Marine Engineering Knowledge)
This course is designed to give the students the knowledge of regulations and systems so that they can apply this knowledge in their profession.

- Water Tube Boilers; Steam Turbines and Steam Plants; Boiler Water Treatment and Testing; Gas Turbines; Introduction to Vibration; Sewage Plant and Pollution; Maintenance; Tanker Operations; Deck Machinery
- Prerequisite: MREK 3104 (Marine Engineering Knowledge)
- Duration: 8 weeks
- Lecture: 8 hours/week

MREK 3203 (Marine Engineering Knowledge)
This course is intended to give the student a knowledge of the behavior and characteristics of common engineering materials and give them an understanding of basic industrial processes. This will enable the students to select suitable materials and fabrication methods for the design and manufacture of parts to ensure successful service. The course also introduces the analysis of stress in load-bearing structural members. The concepts of stress, strain and elasticity are applied to elementary systems and to torsional stress in order to give students an understanding of one of the fundamental building blocks upon which all engineering designs are based.

- Structure of Materials; Physical and Mechanical Properties of Materials; Phase Diagrams; Non-ferrous Metals; Heat Treating Steels; Corrosion; Plastics; Ceramics; Basic Stress Systems; Torsional Shearing Stress
- Prerequisite: MTPR 1200 (Materials and Processes)
- Duration: 13 weeks
- Lectures: 4 hours per week = 52 hours total
- Laboratories: 2 hours every second week = 12 hours total

MTPR 1300 (Materials and Processes)
This course provides students with basic knowledge about the behavior and characteristics of common engineering materials and gives them an introduction to basic refining processes. This is important for understanding materials and fabrication methods for the design and manufacture of parts for durable service in the marine environment.

- Introduction to Vibration; Sewage Plant and Pollution; Maintenance; Confined Space Entry; Deck Machinery; Exhaust Emissions; Oil Pollution Prevention Regulations; Propulsion Plant Simulator Course, Level 1
- Prerequisite: MREK 3204 (Marine Engineering Knowledge IV)
- Duration: 13 weeks
- Lectures: 4 hours/week for 13 weeks = 52 hours total
- Laboratories: 4 hours/week for 13 weeks = 52 hours total

MREK 3206 (Marine Engineering Knowledge VI)
This course is designed to expand on engineering knowledge with respect to steam engineering, gas turbines and maintenance procedures.

- Water Tube Boilers; Steam Boiler Control; Steam Turbines and Steam Plants; Steam Turbine Control; Boiler Water Treatment and Testing; Waste Heat Recovery Systems; Thermal Oil Systems; Gas Turbines
- Prerequisite: MREK 1201 (Marine Engineering Knowledge I)
- Duration: 13 weeks
- Lectures: 5 hours/week = 65 hours total
- Laboratories: 2 hours/week = 26 hours total

MREK 3400 (Marine Engineering Knowledge VII)
This course addresses advanced marine engineering knowledge subjects.

- Preventative Maintenance System; Unmanned Machinery Space (UMS); Governor Control System Fault Diagnosis; Automatic and Manually Operated Control Systems; Control Equipment; Surveys and Dry-Docking
- Prerequisite: MREK 3206 (Marine Engineering Knowledge VI)
- Duration: 13 weeks
- Lectures: 3 hours/week = 39 hours

MTPR 1200 (Materials and Processes)
The purpose of this course is to provide students with knowledge of the behavior and characteristics of common engineering materials and give them an understanding of basic industrial processes. This will enable the students to select suitable materials and fabrication methods for the design and manufacture of parts to ensure successful service. The course also introduces the analysis of stress in load-bearing structural members. The concepts of stress, strain and elasticity are applied to elementary systems and to torsional stress in order to give students an understanding of one of the fundamental building blocks upon which all engineering designs are based.

- Structure of Materials; Physical and Mechanical Properties of Materials; Phase Diagrams; Non-ferrous Metals; Heat Treating Steels; Corrosion; Plastics; Ceramics; Basic Stress Systems; Torsional Shearing Stress
- Prerequisite: MTPR 1200 (Materials and Processes)
- Duration: 13 weeks
- Lectures: 4 hours per week = 52 hours total
- Laboratories: 2 hours every second week = 12 hours total

MTPR 1300 (Materials and Processes)
This course provides students with basic knowledge about the behavior and characteristics of common engineering materials and gives them an introduction to basic refining processes. This is important for understanding materials and fabrication methods for the design and manufacture of parts for durable service in the marine environment.
Production of Steel and Other Metals; Identification of Metals; Physical and Mechanical Properties of Metals; Structure of Metals; Phase Diagrams; Heat Treating; Non-Metal Materials; Adhesives, Ceramics, and Wood

Duration - 5 weeks
Lectures - 6 hours per week = 30 hours total
Laboratories - 2 hours per week = 10 hours total

**MTPR 2100 (Strength of Materials)**

This course is an introduction to the analysis of stresses in load bearing structural members. Concepts of stress, strain and elasticity are applied to elementary systems of normal, shear and bending stress in order to give students an understanding of one of the fundamental building blocks upon which all engineering designs are based.

Basic Stress Systems; Strain and Elasticity; Mechanical Properties of Materials; Shear Force and Bending Moments; Stress Due to Bending; Torsional Shearing Stress; Statically Indeterminate Systems

Prerequisites - MATH 1101 (Introduction to Calculus); MECH 2102 (Mechanics)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

**MTPR 2101 (Strength of Materials)**

This course is an introduction to the analysis of stresses in load bearing structural members. Concepts of stress, strain and elasticity are applied to elementary systems of normal, shear and bending stress in order to give students an understanding of one of the fundamental building blocks upon which all engineering designs are based.

Basic Stress Systems; Strain and Elasticity; Mechanical Properties of Materials; Shear Force and Bending Moments; Stress Due to Bending; Torsional Shearing Stress; Statically Indeterminate Systems

Co-requisite - MATH 1103 (Introduction to Calculus) or MATH 1200 (Calculus); MECH 1100 (Mechanics) or MECH 1101 (Mechanics)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

**MTPR 2103 (Materials and Processes)**

The purpose of this course is to provide students with the knowledge of the behaviour and characteristics of common engineering materials and give them an understanding of basic industrial processes. This will enable students to select suitable materials and fabrication methods for the design and manufacture of parts to ensure successful service.

Production of Steel and Other Metals; Identification of Metals; Physical and Mechanical Properties of Metals; Structure of Metals; Phase Diagrams; Heat Treating; Plasticity and Testing of Materials; Corrosion; Adhesives, Ceramics, and Composites

Duration - 13 weeks
Lectures - 3 hour/week
Laboratories - 2 hours/week

**MTPR 2104 (Materials and Processes)**

This course provides students with knowledge about the behaviour and characteristics of common engineering materials and gives them an understanding of basic industrial processes. This background will enable students to select suitable materials and fabrication methods for the design and manufacture of parts to ensure successful service.

Production of Steel and Other Metals; Identification of Metals; Physical and Mechanical Properties of Metals; Structure of Metals; Phase Diagrams; Heat Treating; Plasticity and Testing of Materials; Corrosion; Adhesives, Ceramics, and Wood

Prerequisite - CHEM 1100 (Chemistry)

Duration - 5 weeks
Lectures - 6 hours/week = 30 hours total
Laboratories - 2 hours/week = 10 hours total

**MTPR 2108 (Strength of Materials)**

This course is an introduction to the analysis of stresses in load bearing structural members. Concepts of stress, strain and elasticity are applied to elementary systems of normal, shear and bending stress in order to give students an understanding of one of the fundamental building blocks upon which all engineering designs are based.

Basic Stress Systems; Strain and Elasticity; Mechanical Properties of Materials; Shear Force and Bending Moments; Stress due to Bending; Torsional Shearing Stress; Statically Indeterminate Systems

Prerequisite - MATH 1105 (Introduction to Calculus); MECH 2111 (Statics and Dynamics)

Duration - 13 weeks
Lectures - 3 hours/week = 30 hours total
Laboratories - 2 hours/week for 5 weeks = 10 hours total

**MTPR 3104 (Strength of Materials)**

This second Strength of Materials course expands on previously studied concepts of simple stress, strain and elasticity, and provides a basis for elementary calculations in engineering design.

Strain Energy, Impact Loads; Combined Bending and Direct Stresses; Bolted, Riveted and Welded Joints; Deflection of Beams; Columns; Complex Stress and Strain Systems

Prerequisite - MTPR 2108 (Strength of Materials)

Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours

**MTPR 3201 (Strength of Materials)**

This advanced course in Strength of Materials extends on the application of fundamental principles presented in Strength of Materials 2100 and Strength of Materials 3100. This course is intended to familiarize students with elements of structural design and machine component design often observed aboard ships.

Calculation Sheets; Design Morphology; Evaluation of Criteria and Constraints; Problem Analysis; Design Considerations; Codes and Standards; Precision and Rounding of Dimensions

Prerequisite - MTPR 3100 (Strength of Materials)

Duration - 5 weeks
Lectures - 6 hours per week

**NARC 1101 (Ship Hull Geometry)**

This course will develop an ability to define the complex geometry of a ship’s hull form with emphasis on practical draughting skills required to attain a fair and accurate form.

Lines Plan Interpretation; Terminology and Form Coefficients; Hull Forms; Draughting Techniques; Lifting Hull Lines

Prerequisites - PHYS 1200 (Physics); MATH 1101 (Introduction to Calculus); ENGR 1103 (Engineering Graphics); NARC 1103 (Ships and Shipping)

Duration - 5 weeks
Lectures - 4 hours/week = 20 hours total
Laboratories - 6 hours/week = 30 hours total

**NARC 1102 (Ship Structural Geometry)**

This is an introductory course to ship structures designed to familiarize students with structural arrangements and nomenclature and to improve their computer aided drafting ability.

Frames Systems; Bottom Structure; Side Structure; Deck Structure; Bulkhead Structure; Shell Structure; Fore End Structure; All End Structure

Prerequisite - MATH 1100 (Pre-Calculus); ENGR 1103 (Engineering Graphics); ENSY 1302 (Introduction to MESH)

Co-requisite - ENGR 1201 (Introduction to AutoCAD)

Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 2 hours/week

**NARC 1103 (Ships and Shipping)**

This is a first level course designed to introduce the basic elements of ship design. Ships’ missions are related to vessel dimensions, general layout, hull form, structure and stability characteristics. Emphasis is placed on the interpretation of ships’ drawings including the lines plan, general arrangement and profile and decks.

Purpose of Ships; Primary Design Criteria; The Ship Design Process; Loads On A Ship; Structural Framing Systems; Ships Types and Structure; Engineering Fundamentals; Buoyancy and Weight; Transverse Stability; Ship Types and Stability

Co-requisite - ENGR 1103

Duration - 5 weeks
Lectures - 5 hours/week - 65 hours total

**NARC 1104 (Ship Steel Structure)**

This is an introductory course to ship structures designed to familiarize students with structural arrangements and nomenclature and to improve their computer aided drafting ability.

Bottom Structure; Side Structure; Deck Structure; Bulkhead Structure; Shell Structure

Prerequisites - MATH 1100 (Pre-Calculus); PHYS 1100 (Physics); ENGR 1103 (Engineering Graphics); NARC 1103 (Ships and Shipping)

Co-requisite - ENGR 1201 (Introduction to AutoCAD)

Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 2 hours/week

**NARC 2100 (Naval Architecture)**

This is a course designed to develop students’ ability to perform ship area and volume calculations with emphasis on practical skills to read lines plan and extract data to create cross-section drawings in way of machinery spaces.
Lines Plan; Draft and Trim; Coefficients of Hull Form; Integrating Rules and Methods; Tonnes per Centimetre of Immersion (TPC); Centre of Rotation; Volume and Displacement; Buoyancy and the Centre of Buoyancy/VCB; LCD; Centre of Gravity; Hydrostatic Curves.

Prerequisites - ENSY 1201 (Ship Types and Systems); NARC 3102 (Ship Structural Geometry)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 1 hour/week

NARC 2101 (Naval Architecture)
This is an intermediate year course designed for students in the Marine Engineering Diploma of Technology program to prepare them for Transport Canada examinations as Second and Chief Engineers.

Ship Arrangements and Configurations; Ship Terms and Definitions; Stresses in Ships' Structures; Shell Sections used in Shipbuilding; Classification Societies and Regulatory Agencies; Keels; Framing Systems; Single-bottom Construction; Double-bottom Construction; Shell Plating; Strengthening for Navigation in Ice; Bulbkeads; Deck Structures; Hatch Covers; Forward End Structural Arrangements and Details; Anchoring and Mooring Arrangements; Testing of Anchors and Cables; All End Structural Arrangements and Details; Shafting and Stern Tube Alignment
Duration - 13 weeks
Lectures - 3 hours/week

NARC 2102 (Shipbuilding)
This is the first of two courses to develop the students' understanding of ship structures and the rules and regulations which affect the design, construction, and repair of ships.

The Ship's Environment; Stresses on a Ship; Construction Terminology; Plates and Sections; The Hull Girder; Construction Materials; Framing Systems; Construction Details; Interpretation of Ship's Drawings; Conversion of Ship Types; Fore End Structures; And Aft End Structures; Superstructures and Deckhouses; Bulwarks and Freeing Ports; Hull and Deck; Coatings and Paints; Welding and Cutting; Destructive Examination Techniques; Steel; Forming of Steel Plate; Structural Repair Work; Non-Destructive Examination Techniques
Prerequisites - NASC 1204 (Seamanship II), WKTM 1102 (Sea Survival); NARC 2103 (Ship Stability)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 1 hour/week = 13 hours total

NARC 2103 (Ship Stability)
This course develops an understanding of statical stability theory; criteria for stability assessment and rules and regulations impacting on vessel stability. Emphasis is placed on practical application of the theory to generate a complete Trim and Stability Booklet to Transport Canada standards.

Large Angle Stability; Free Surface; Inclining Test; Tank Calculations; Condition Sheets; Rules and Regulations - Stability; Trim and Stability Booklet; Computer Software Application
Prerequisite - NARC 2109 (Hydrostatics)
Duration - 13 weeks
Lectures - 5 hours/week

NARC 2109 (Hydrostatics)
This is an intermediate level course designed to introduce students to the principles of hydrostatics in preparation for further courses in ship stability.

Basic Hydrostatics; Numerical Calculations; Hydrostatics Calculations; Hydrostatic Curves; Ship Mass and Center of Mass; Small Angle Stability; Longitudinal Stability and Trim
Prerequisites - Marine Engineering Systems Design Principles
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

NARC 2110 (Ship Operations Management)
This course will develop a students understanding of the basics of engineering economic analysis and the economic environment in which ships operate.

Ship Owners; Income and Expenses; The Time Value of Money; Methods of Economic Analysis; Sensitivity Analysis; Mission Profiles
Prerequisites - NARC 2103 (Ship Stability); NARC 2207 (Ship Building); NARC 2208 (Ship Building)
Duration - 5 weeks
Lectures/Instruction - 7 hours/week = 35 hours total

NARC 2200 (Naval Architecture)
This course is designed to develop the student's understanding of ship's stability as well as national and international regulations and standards related to stability criteria.

Stability at Small Angles of Heel; Longitudinal Stability; Stability at Large Angles of Heel; Effect on Stability by Lifting Weight; Angle of List Caused by Transverse Shift of Items of Deadweight
Prerequisite - NARC 2100 (Naval Architecture)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 1 hour/week

NARC 2201 (Resistance and Propulsion)
This is an intermediate level course intended to introduce students in the Naval Architecture program to the concepts associated with the resistance associated with ship movement. The course will develop students' ability to perform calculations associated with propulsion and propeller selection.

Ship Resistance; Ship Friction and Viscous Resistance; Wave Making Resistance; Similary and Model Testing; Other Resistance Components; Propulsion; Preliminary Propeller and Powering Calculation; Screw Propeller; Propeller Ship Interaction; Propeller Cavitation
Prerequisite - MATH 2101 (Advanced Calculus); NARC 2103 (Ship Stability); MREK 2101 (Marine Engineering Knowledge)
Duration - 13 weeks
Lectures/Laboratories - 5 hours/week = 65 hours total

NARC 2202 (Ship Building)
This course is designed to develop a student's understanding of ship structures and the rules and regulations which affect the design, construction, and repair of ships.

Rudders; Steering and Maneuvering; Welding and Cutting Procedures; Riveting; Shipyard Practice; Rules and Regulations; Structural Fire Protection; Watertight Divisions; Loadlines; Tonnage; Surveys and Maintenance; Repair Procedures and Damage Reports
Prerequisite - NARC 2102 (Ship Building)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 1 hour/week = 13 hours total

NARC 2207 (Ship Building)
This is the second of two intermediate level courses designed to give the student a working knowledge of the methods and practices of modern steel ship yards.

Development of Unit Construction; Unit Breakdown; Unit Drawing; Methods of Joining Structural Parts; Weights and Centroids; Material List and Coding; Lofting; Cutting and Erecting Steel; Forming of Steel Plate; Structural Repair Work; Non-Destructive Examination Techniques
Prerequisites - MREK 2101 (Marine Engineering Knowledge); NARC 2107 (Ship Building); NARC 2108 (Ship Building)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

NARC 2208 (Ship Building)
This is the first of two courses designed to give the student a working knowledge of the structural calculations involved in the design of a ship.

Ship Building Materials; Simple Ship Stresses; Ship Hull Girder; Longitudinal Strength Calculation; Transverse Strength; Sea Loads; Fatigue/Brittle Fracture; Classification Societies; Midship Section Scantlings and Sections Drawing
Prerequisites - NARC 2109 (Hydrostatics); NARC 2107 (Ship Building); NARC 2108 (Ship Building); MTPR 2100 (Strength of Materials)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

NARC 2209 (Navigation Safety)
This course in navigation safety covers the International Regulations for Preventing Collisions at Sea with Canadian modifications as contained in Transport Canada's Collision Regulations TP 10739. It includes IMO's basic watchkeeping principles and recommendations as stated in the STCW'95 Code sections A-VIII/2 and B-VIII/2.

General; Steering and Sailing Rules; Lights and Shapes; Sound and Light Signals; Exemptions and Additional Canadian Provisions; Positioning and Technical Details of Lights and Shapes; Additional Signals for Fishing Vessels in Close Proximity; Technical Details of Sound Signal Appliances; Distress Signals; STCW'95 Standard Watchkeeping Procedures and Practices
Prerequisites - NASC 1204 (Seamanship II), WKT 1102 (Sea Phase I)
Duration - 13 weeks
Lectures - 3 hours/week for 13 weeks = 39 hours total
Laboratories - 2 hours/week for 13 weeks = 26 hours total

NARC 2228 (Shipbuilding)
This is the first of two courses to develop student understanding of ship structures and the rules and regulations which affect the design, construction and repair of ships.

Stresses on a Ship; Ship Construction Terminology; Construction of Typical Ship Types; Construction Materials; Framing Systems; Keels and Bottom Structure; Shell Plating; Bulbkeads and Pillars; Fore End Structures; Aft End Structures; Decks and Hatches; Superstructures and Deckhouses; Bulwarks and Freeing Ports; Ice Strengthening
Prerequisites - NARC 2202 (Shipbuilding)
COURSE DESCRIPTIONS

NARC 2318 (Shipbuilding - Mechanical)
This is the second of two courses designed to give the student a working knowledge of the structural calculations involved in the design of a ship.

NARC 2401 (Preliminary Design Project)
This practical lab course is designed to give Naval Architecture students the opportunity to apply skills learned in preceding program courses and in the concurrent NARC 3102 (Ship Design) course.

NARC 3102 (Ship Design)
This lecture-based course is designed to provide Naval Architecture students with rational design theory and standard tools.

NARC 3103 (Ship Structural Design)
The purpose of this course is to provide the student with a basic knowledge of the materials, processes and structural details involved with the construction of composite boats. This will enable the selection of suitable materials and fabrication methods for the design and production of Fibre Reinforced Plastic boat hulls and decks. The student will be able to determine structural scantlings and create the appropriate drawings required for approval by internationally recognized classification societies.

NARC 3104 (Preliminary Design Project)
This course is designed for Marine Engineering Diploma of Technology students to gain a firm understanding of ship propulsion and resulting fuel consumption. Focus will be directed on various propulsion system characteristics and design. Rudder design and theory is also covered in the course.

NARC 3200 (Ship Structural Design Project)
This is an advanced year course designed for students in the Marine Engineering Diploma of Technology program to introduce them to the fundamentals and applications of stability theory.

NARC 3201 (Marine Electrical Project)
This course is designed to give students the guided possibility to develop marine engineering design drawings and calculations. The exercise is closely inter-connected with the student Ship Design Project enhancing correctness of ship structure design and space division to accommodate machinery.

NARC 3202 (Marine Engineering Project)
This course is designed to give students the guided possibility to develop marine engineering design drawings and calculations. The exercise is closely inter-connected with the student Ship Design Project enhancing correctness of ship structure design and space division to accommodate machinery.

NARC 3203 (Hull Form Development Project)
This course develops an understanding of the factors influencing hull form design. Hard lines and computer generated lines are developed by the student to satisfy particular design criteria. Throughout, emphasis is placed on practical application. Defining the Hull; Factors Influencing Hull Form; Coefficients of Form; Development from Basis Hull Form; First Principle Approach; Preliminary Lines; Computer Generated Lines; Developable Hull Forms.

NARC 3204 (Ship Structural Design Project)
This course is intended to expand and reinforce the knowledge gained in previous Ship Structure courses.

Prerequisites:
- NARC 2101 (Naval Architecture)
- NARC 2103 (Ship Structural Design)
- NARC 2401 (Preliminary Design Project)
- NARC 2402 (Barneship - Composite Structure)
- NARC 2403 (Ship Structural Design Project)
- NARC 3104 (Preliminary Design Project)
NASC 3206 (Ship Arrangement Project)

This course is designed to give students of Naval Architecture the opportunity to apply skills learned in preceding courses. Proportions; Freeboard; General Arrangement; Powering.

Prerequisites - NARC 3102 (Ship Design);
NASC 3104 (Preliminary Design Project); NARC 3203 (Hull Form Development Project); NARC 2201 (Resistance & Propulsion)

Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 24 hours total

NASC 3208 (Boat Design-Fabrication)

This is a project based course designed to lead the student through the practical steps involved in the construction of a moulded hull from a designer’s initial lines plan to the first moulded product. Project Management; Quantity Surveying; Plug Design and Construction; Mould Design and Construction; Hull Construction; High Speed Boat Design.

Prerequisite - NARC3108 (Boat Design - Composite Structure)

Duration - 13 weeks
Lectures - 2 hours per week
Laboratories - 3 hours per week

NASC 3209 (Offshore Installations and Productions)

This course is designed to familiarize students with how oil and gas exploration is carried out offshore, provide an introduction to drilling equipment and operations, and describe offshore field development options and production systems. Looking For Oil and Gas Offshore; Offshore Environmental Conditions; Environmental Loads on Offshore Structures; Offshore Exploration – Drilling Vessel Types and Selection; Offshore Operations – Drilling Equipment and Operations; Offshore Production Wells; Primary Processing of Oil and Gas Offshore; Classification and Certification.

Duration - 5 weeks
Lectures - 7 hours/week = 35 hours total
Lab - 4 hours/week = 20 hours total

NASC 3300 (Ship Design Project)

This course is designed to give students of Naval Architecture the opportunity to apply skills learned in preceding courses. Capacities; Trim and Stability; Damaged Stability; Cost Estimates; Oral Presentation.

Prerequisites - NARC 3201 (Marine Electrical Project); NARC 3202 (Marine Engineering Project); NARC 3203 (Hull Form Development Project); NARC 3204 (Ship Structural Design Project); NARC 3206 (Ship Arrangement Project)

Duration - 5 weeks
Lectures - 18 hours/week = 90 hours total
Laboratories - 0 hours/week = 0 hours total

NASC 0100 (General Ship Knowledge)

This is an introductory course intended for new entry seapersons who intend to embark upon a marine career where they form part of the Bridge Watch Team. Its purpose is to provide awareness of the hazards, knowledge, skills, and standards of safe working procedures leading to certification as Bridge Watch Rating in compliance with International Maritime Organization’s (IMO) Standards of Training, Certification, and Watchkeeping (STCW) 1978, as amended by STCW 1995 and Transport Canada Marine Safety TP-10936E.

Organization and the Working Structures of Sea-Going Vessels; Types and Classes of Vessels; Cargo Handling Gear; Cargo Operations; General Seamanship; Shipboard Operations; Safety on Board.

Lectures - 13 hours/week
Laboratories - 6 hours/week

NASC 0101 (General Ship Knowledge I)

This is an introductory course intended for new entry seafarers who intend to embark upon a marine career where they form part of the Bridge Watch Team. Its purpose is to provide awareness of the hazards, knowledge, skills, and standards of safe working procedures leading to certification as Bridge Watch Rating in compliance with International Maritime Organization’s (IMO) Standards of Training, Certification, and Watchkeeping (STCW) 1978, as amended by STCW 1995 and Transport Canada Marine Safety TP-10936E.

Organization and the Working Structures of Sea-Going Vessels; Types and Classes of Vessels; General Seamanship; Shipboard Operations; Safety on Board.

Duration - 13 weeks
Lectures - 13 hours/week; 169 hours total
Laboratories - 6 hours/week; 78 hours total

NASC 0201 (General Ship Knowledge II)

This is the second of two courses intended for new entry seafarers who intend to embark upon a marine career where they form part of the Bridge Watch Team. Its purpose is to provide awareness of the hazards, knowledge, skills, and standards of safe working procedures leading to certification as Bridge Watch Rating in compliance with International Maritime Organization’s (IMO) Standards of Training, Certification, and Watchkeeping (STCW) 1978, as amended by STCW 1995 and Transport Canada Marine Safety TP-10936E.

Cargo Handling Gear; Cargo Operations; General Seamanship

Prerequisites - NASC 01XX (General Ship Knowledge I)

Duration - 4 weeks
Lectures - 13 hours/week; 52 hours total
Laboratories - 6 hours/week; 24 hours total

NASC 1100 (Orientation to Cargo Operations and Navigation)

This is an introductory course designed to explore the key aspects of a deck officer’s responsibility, namely navigation and cargo operations.

Navigation/Chartwork; Cargo Operations

Duration - 5 weeks
Lectures - 12 hours/week

NASC 1101 (Introduction To Ships)

This is an introductory course designed to provide the student with an orientation to the Marine industry and the types of ships that are commonly encountered during a seagoing career. The course will provide the student with a basic vocabulary related to ships and equipment, an introduction to typical shipboard routines and an overview of lookout duties including an introduction to the Collision regulations. A detailed analysis of the requirements of the Cadet Log Book will also be undertaken.

Introduction/Busines of Shipping; Terminology; General Arrangements/Equipment; Rules of the Road; Cadet Log Book; Shipboard Routins

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

NASC 1102 (Basic Shipboard Rules)

This is an entry level course which will develop linkages between theoretical and practical seamanship.

Practical Training for Deck Personnel; Rope, Wire, Chains, and Tackles; Confined Space Awareness

Duration - 5 weeks
Lectures - 9 hours/week
Laboratories - 14 hours/week

NASC 1104 (Seamanship I)

This is an introductory course designed to provide the student with an orientation to the marine industry and the types of ships that are commonly encountered during a seagoing career. The course will provide basic seamanship knowledge about ship terminologies, navigation publications and stability.

Introduction/Fusiness of Shipping; Organisational Structure Onboard Ships; Terminology; General Arrangements; Stability; Anchor and Shackles; Cargo Handling Equipment; Mooring; Navigation; Bridge Equipment Onboard Ships; Soundings

Duration - 13 weeks
Lectures - 13 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

NASC 1204 (Seamanship II)

This is a course designed to develop learners’ ability to perform basic stability calculations with emphasis on practical skills, to extract data from hydrostatic curves, and to perform calculations related to ships draft, list, trim, and centre of gravity.

Principal Ship Dimensions & Hull Terminology; Draft; Trim; Density & Displacement; Coefficients of Hull Form & Hydrostatic Data; TPC & PWA; Centre of Flotation; Volume and Displacement; Buoyancy and the Centre of Buoyancy; Centre of Gravity; Free Surface; Adding and Shifting Masses; List; Moment to Change Trim; Stability Data Booklet.

Prerequisites - MATH 1212 (NASC Mathematics II); PHYS 1200 (Physics) or PHYS 1204 (Physics); NASC 1104 (Seamanship I)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

COURSES DESCRIPTIONS

NASC 1303 (Shipboard Skills)

This course will build upon the knowledge gained in Seamanship Level 1 and Seamanship Level 2 courses to support practical shipboard skill development.

Prerequisites - NASC 1104 (Seamanship I)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

NASC 1304 (Seamanship for Non-crew Members)

This introductory course will provide students who will be employed in non-crew positions with knowledge of vessels and operations as well as basic seamanship skills.

Organization and Working Structure of a Merchant Vessel; Health, Safety, and Environmental Regulations and Policies; General Seamanship

Duration - 6 weeks
Lectures - 2 hours per week = 12 total hours

NASC 2101 (Stability I)

This is a course designed to develop learners’ ability to perform basic stability calculations with emphasis on practical skills, to extract data from hydrostatic curves, and to perform calculations related to ships draft, list, trim, and centre of gravity.

Principal Ship Dimensions & Hull Terminology; Draft; Trim; Density & Displacement; Coefficients of Hull Form & Hydrostatic Data; TPC & PWA; Centre of Flotation; Volume and Displacement; Buoyancy and the Centre of Buoyancy; Centre of Gravity; Free Surface; Adding and Shifting Masses; List; Moment to Change Trim; Stability Data Booklet.

Prerequisites - MATH 1212 (NASC Mathematics II); PHYS 1200 (Physics) or PHYS 1204 (Physics); NASC 1104 (Seamanship I)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

COURSES DESCRIPTIONS

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NASC 1204 (Seamanship II)

This is a course designed to develop learners’ ability to perform basic stability calculations with emphasis on practical skills, to extract data from hydrostatic curves, and to perform calculations related to ships draft, list, trim, and centre of gravity.

Principal Ship Dimensions & Hull Terminology; Draft; Trim; Density & Displacement; Coefficients of Hull Form & Hydrostatic Data; TPC & PWA; Centre of Flotation; Volume and Displacement; Buoyancy and the Centre of Buoyancy; Centre of Gravity; Free Surface; Adding and Shifting Masses; List; Moment to Change Trim; Stability Data Booklet.

Prerequisites - MATH 1212 (NASC Mathematics II); PHYS 1200 (Physics) or PHYS 1204 (Physics); NASC 1104 (Seamanship I)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

COURSES DESCRIPTIONS

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**COURSE DESCRIPTIONS**

**NASC 2102 (Navigation Systems - SEN 1A1)**
- This course is the first of three SEN courses which the student must complete to obtain a credit in the Nautical Science Diploma of Technology Program and a Canadian Watchkeeping Mate Certificate. The purpose of NASC 2102 is to provide the student with the knowledge and the skill required for the correct operation of navigational equipment and radar to avoid collision or close quarter situations.
- **Prerequisite:** -NASC 2102 (Navigation Systems - SEN 1A1) credit.
- **Duration:** - 13 weeks
- **Lectures:** - 3 hours/week for 13 weeks = 39 hours total
- **Laboratories:** - 2 hours/week for 13 labs = 26 hours total

**NASC 2001 (Seamanship)**
- This course is designed to give students in-depth knowledge and practical understanding of working aboard a ship, thus enabling them to become an efficient and effective cadet. The concepts taught here will form the basis for further studies in seamanship.
- **Prerequisite:** - NASC 1003
- **Co-requisite:** - NASC 2108 (Navigation)
- **Duration:** - 13 weeks
- **Lectures:** - 6 hours/week for 13 weeks = 65 hours total
- **Laboratories:** - 2 hours/week for 13 labs = 26 hours total

**NASC 2103 (Seamanship)**
- This course is designed to give students in-depth knowledge and practical understanding of work aboard a ship, thus enabling them to become an efficient and effective cadet. The concepts taught here will form the basis for further studies in seamanship.
- **Prerequisite:** - NASC 1003
- **Co-requisite:** - NASC 2108 (Navigation)
- **Duration:** - 13 weeks
- **Lectures:** - 6 hours/week for 13 weeks = 65 hours total
- **Laboratories:** - 2 hours/week for 13 labs = 26 hours total

**NASC 2104 (Principles of Cargo Operations & Navigation)**
- This course is designed to build on the basic knowledge acquired in NASC 2112 (Introduction to Cargo Operations) and to give the student an advanced understanding of the principles and practices of cargo operations.
- **Prerequisite:** - NASC 2112
- **Co-requisite:** - NASC 2104 (Principles of Cargo Operations & Navigation)
- **Duration:** - 13 weeks
- **Lectures:** - 6 hours/week
- **Laboratories:** - 1 hour/week

**NASC 2111 (Electronic Positioning Systems 1 (EPS1))**
- This course is designed to build on the basic knowledge acquired in NASC 2112 (Introduction to Cargo Operations) and to give the student an advanced understanding of the principles and practices of cargo operations.
- **Prerequisite:** - NASC 2112
- **Duration:** - 13 weeks
- **Lectures:** - 4 hours/week - 52 hours total
- **Laboratories:** - 0 hours/week = a total of 0 hours

**NASC 2117 (Weather Observation - Maritime Commercial)**
- This course provides students with the knowledge and practical skills to effectively operate and communicate using the Global Maritime Distress and Safety System, as outlined in the International Maritime Organization's Resolution A 769 (18).
- **Prerequisite:** -NASC 2117 (Weather Observation - Maritime Commercial) credit.
- **Duration:** - 13 weeks
- **Lectures:** - 3 hours/week for 13 weeks = 39 hours total
- **Laboratories:** - 2 hours/week for 13 labs = 26 hours total
Archiving ECDIS Data and Data Logging; Responsibility and Effective Navigation with ECDIS

**Prerequisite** - NASC 2108 (Navigation)

**Duration** - 5 days for a total of 40 hours

**Theory** - 28 hours

**Practical** - 12 hours (Maximum of 1 participant per ECDIS unit)

**NASC 2300 (Navigation Systems - SEN)**

NASC 2300 is the third part of three-part mandatory safety related course credit which the student must complete to obtain a credit in the Nautical Science Diploma of Technology Program and the Canadian Watchkeeping Mate Certificate. Students experience proper bridge watchkeeping practices and procedures on a blind piloting simulator.

A simulated course designed for ship's officers in order to execute proper bridge watchkeeping on board ships.

* Successful completion will satisfy the requirements for SEN I (Transport Canada) credit.

**Radar Simulator Operator’s Controls and Characteristics (IMO)** - Review of Plotting Skills (Basic Radar); Bridge Navigational Watch; Open Water Navigation (IMO); Operational use of ARPA; Coastal Water Navigation; and Navigate in or near Traffic Separation Schemes

**Prerequisite** - NASC 2202 (Navigation Systems - Sen) Simulation - 70 hours (minimum of 10 days)

**NASC 2305 (Radio Communication Protocols)**

This course provides participants with the knowledge and practical skills to effectively operate and communicate using Radio/Inmarsat Communication System(s) in accordance with the fundamental recommendations for training of maritime radio personnel as outlined in the International Maritime Organization’s Resolution A.770(17).

Radio/Inmarsat Communication System Theory; Practical Radio Communication Operations on MF/HF; Practical Inmarsat Communication Procedures on Inmarsat B, C, and Fleet 77

**Co-requisite** - NASC 2107 (Restricted Operator’s Certificate - Maritime Commercial)

**Duration** - 2 days

**Lectures/Practical Exercises** - 7 hours/day = 14 hours

**NASC 2306 (Electronic Chart Display and Information Systems (ECDIS))**

The purpose of this course is to provide training for students in the sea operation of Electronic Chart Display and Information Systems (ECDIS).

ECDIS Definitions, Concepts and Related Authorities; Legal Aspects and Requirements; Principle Types of Electronic Charts; ECDIS Data; Presentation of ECDIS Data; Sensors; Basic Navigational Functions and Settings; Specific Functions for Route Planning; Specific Functions for Route Monitoring; Updating; Display and Function of Other Navigational Information; Errors of Displayed Data; Errors of Interpretation; Status Indications, Indicators and Alarms; Documentation; Integrity Monitoring; Back-Up; Risk of Over-Reliance on ECDIS; Proficiency Demonstration.

**Prerequisites** - NASC 2108 (Navigation) or Pass or Completion of Chartwork and Pilotage (CP&P)

**Duration** - 5 days (30 hours)

**Theory** - 5 hours

**Practical** - 20 hours*  
* Maximum of 1 participant per ECDIS unit

**NASC 2307 (Communications)**

This course is designed to provide students with the knowledge and skills necessary to use the International Maritime Telecommunication System (IMTS), extract a variety of necessary information from the Canadian publications Radio Aids to Marine Navigation and Notices to Mariners – Annual Edition, send and receive signals by Morse light, and use IMO’s Standard Marine Communication Phrases.

International Code of Signals; Publications; Morse Code; Standard Marine Communication Phrases

**Prerequisites** - NASC 1204 (Seamanship II) Duration - 30 hours

**Lectures** - 3 hours/day for 5 days = 15 hours total

**Laboratories** - 3 hours/day for 5 days = 15 hours total

**NASC 3100 (Navigation)**

This advanced course in navigation develops the student’s ability to analyze and to solve problems connected with the safe and economic conduct of a passage. The aim of this course is to develop an understanding of chartwork and piloting up to and beyond that required for the Watchkeeping Mate Certificate of Competency.

Navigation Procedures; Advanced Chartwork; The Magnetic Compass; Pilotage; GPS; and Navigation Passage Making/Planning

**Prerequisites** - NASC 2108 (Navigation); WKTG 1102 (Sea Phase I - Nautical Science)

**Duration** - 13 weeks

**Lectures** - 4 hours/week

**Laboratories** - 4 hours/week

**NASC 3101 (Navigation Safety - Collision Regulations)**

This course in Navigation Safety covers the Collision Regulations TP 10739 and the Recommended Code of Nautical Procedures and Practices. (It includes the IMO’s Basic Watchkeeping Principles)

General; Steering and Sailing Rules; Lights and Shapes; Sound and Light Signals; Distress Signals; Exemptions and Canadian Provisions; Details of Sound and Light Signals; Code of Nautical Procedures and Practices

**Prerequisite** - WKTG 1102 (Sea Phase I - Nautical Science)

**Duration** - 5 weeks

**Lectures** - 15 hours/week

**NASC 3102 (Cargo Operations)**

This course is designed to build on previous courses to increase the student’s knowledge and understanding of cargo and cargo operations in a practical sense.  

Ro-Ro Vessels; Self-unloading Bulk Carriers; Liquefied Gas Carriers; Chemical Tankers; Passenger Vessels; Timber Deck Carriages; Timber Deck Cargo Code; Timber Deck Cargo Regulations; Livestock; Coal Carriages; Voyage Planning and Loading; Port Wardens; Cargo Surveys; Cargo Liner Trade; and Future Trends; Tank and Hold Inspection

**Prerequisite** - NASC 2104 (Principles of Cargo Operations & Navigation)

**Duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**NASC 3103 (Seamanship)**

This course deals with advanced topics in seamanship and is designed to build on both the sea phase experience of the student as well as other courses in this series covering seafaring skills. Like the other courses in the series, it is meant to prepare the student to become a professional seafarer and an officer.

Shipboard Emergencies (At Sea and In Port); Search and Rescue Operations; SOLAS 1974 as amended (The International Convention for the Safety of Life at Sea)

**Prerequisite** - NASC 2203 (Seamanship)

**Duration** - 13 weeks

**Lectures** - 2 hours/week

**Laboratories** - 1 hour/week

**NASC 3108 (Stability II)**

This course builds on the basic theory offered in Stability I (NASC 2101) to develop students’ ability to understand the principles governing small and large angles and stability. Practical skills to solve a problem with stability problems are developed. The elements of Dynamic Stability are discussed and the IMO’s Stability Requirements are covered.

The Metacentre and Metacentre Height; Small Angle Stability; Cross Curves; Large Angle Stability; Trim and Stability Assessment; Dynamic Stability; Special Criteria for Certain Ships; Considerations for Watertight Integrity; Practical Calculations Using MV Atlantic Vision and MV Gypsum Centennial

**Prerequisite** - NASC 2101 (Stability)

**Duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 1 hour/week = 13 hours total

**NASC 3200 (Navigation)**

The aim of this course is to develop an understanding of practical navigation to a level required for all ocean and offshore navigation on board ship. Navigation principles are briefly revisited to ensure the student is fully conversant with the theoretical knowledge covered in other courses.

Navigation Principles; Latitude and Time of Meridian Passage; Latitude by Polaris; Position Lines and Position Circles; Sight Reduction Tables and Sight Planning

**Prerequisites** - NASC 2109 (Navigation); WKTG 2102 (Sea Phase II - Nautical Science)

**Duration** - 13 weeks

**Lectures** - 4 hours/week = 52 hours

**Laboratories** - 4 hours/week = 52 hours

**NASC 3201 (GMDS)**

This is a comprehensive course which enables radio station personnel, ashore and afloat, in operating in accordance with the Global Maritime Distress and Safety System (GMDS) to utilize efficiently all aspects of the GMDS communications matrix. In addition, this course adheres to the fundamental recommendations for training of maritime radio personnel as outlined in the International Maritime Organization’s Resolution A. 703(17).

The Global Maritime Distress and Safety System (GMDS); Regulations and Publications Pertaining to the GMDS; Radio Theory; Practical Radio Communication Operations on VHF/MF/ HF Digital Selective Calling (DSC); Practical DSC Procedures on VHF/MF/HF; International; Practical Inmarsat Communication Procedures on Inmarsat A and C; Enhanced Group Calling (EGC) Teles Over Radio (TOR); NAVTEX; Power Supplies & Maintenance; Emergency Position Indicating Radio-Beacon (EPIRB); Search and Rescue Radar Transponder (SART)

**Prerequisite** - NASC 2107 (Restricted Operator’s Certificate - Maritime Commercial)

**Duration** - 10 days

**Lectures/Practical Exercises** - 6.5 hours/day = 65 hours total

**NASC 3208 (Stability III)**

This advanced level course links stability theory with practical applications. Drawing on the student’s knowledge of cargo operations and vessel stability criteria, this course will, through calculations, enhance the student’s ability to optimize cargo distribution and to provide adequate statical and dynamical stability for a vessel’s safe passage.

Damage Stability: Grounding and Docking: Pressure Exerted by a Liquid; Vessel Stresses; Longitudinal Strength; M. V. Atlantic Vision and M.V. Gypsum Centennial; Ship Motions; Cargo Loading and Stress Measuring Instruments and Software

**Prerequisites** - WKTG 2102 (Sea Phase II - Nautical Science); NASC 3108 (Stability)

**Duration** - 13 weeks

**Lectures/Work Periods** - 4 hours/week = 52 hours total

**NASC 3209 (Advanced Navigation Safety)**

This is an advanced course designed to examine the application of the International Regulations for Preventing Collisions at Sea (Collision Regulations) by building on the knowledge acquired in NASC 2209 (Navigation Safety) and the seagoing experience gained during WKTG 2102 (Sea Phase II). Court judgments will be analyzed to illustrate how various rules are applied, particularly when dealing with concepts such as proper look-out, full awareness, safe speed and positive action in all amire. Collision Regulations Part A – General; Collision Regulations Part B – Steering and Sailing Rules; Collision Regulations Part C – Lights and Shapes; Collision Regulations Part D – Sound and Light Signals
Prerequisites - NASC 2209 (Navigation Safety); WKTM 2102 (Sea Phase II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

**NASC 3210 (Navigation Systems and Instruments)**

This course will enable the student to recognize the fallibility of all electronic aids. The student will recognize the importance of combining different methods of marine navigation while possessing technical skills and a preparedness to fall back on basic, non-electronic navigation methods at any time.

*Navigation Systems and Instruments; Integrated Bridge Systems (IBS); High Precision Positioning Systems; Dynamic Positioning (DP) Systems; Time; Electricity; Marine Compasses; Heading Control Systems and Auto Pilots; Bridge Equipment and Systems; Marine Radio Communications*

Prerequisites - NASC 2202 (Navigation Systems-SEN IA2); WKTM 2102 (Sea Phase II)
Duration - 13 weeks
Laboratories - 4 hours/week for a total of 52 hours

**NASC 3211 (Seamanship III)**

This course deals with advanced topics in seamanship and is designed to build on both the student’s sea phase experience as well as other seamanship skills courses. Like the other courses in the series, it is meant to prepare the student to become a professional seafaring officer.

*Principles of Ship Handling; Steering Control Systems; Anchoring; Mooring; Navigating in Locks; Shipboard Emergencies at Sea and in Port; Search and Rescue (SAR) Operations; Ice Navigation; SOLAS 1974 as amended (The International Convention for the Safety of Life at Sea)*

Prerequisites - NASC 1204 (Seamanship II), WKTM 2102 (Sea Phase II)
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

**NASC 3212 (Navigation Systems and Instruments)**

This course is a continuation of NASC 3210 Navigation (Systems and Instruments I). The focus is on non-electronic navigation instruments, particularly the marine magnetic compass. It will enable the student to understand the principles of magnetic compasses, electromagnetic compasses and marine transmitting magnetic heading devices. It will also enable the student to develop the ability to determine and allow for errors of the magnetic compass.

*Magnetic Compass; Errors of the Magnetic Compass and their Correction; Compass Adjustment*

Prerequisites - NASC 2202 (Navigation Systems-SEN IA2); WKTM 2102 (Sea Phase II)
Duration - 13 weeks
Lectures - 3 hours/week for a total of 39 hours

**NASC 3300 (Seamanship)**

This course is designed to give students an advanced knowledge and understanding of the techniques required to be an efficient and responsible ship handler, and to prepare students to be observant cargo officers who are prepared to make cargo handling adjustments if and when necessary.

*Ship Handling; Heavy Lifts and Cargo Lashing; On Board Practical Training*

Prerequisites - NASC 3103 (Seamanship); WKTM 2102 (Sea Phase II - Nautical Science)
Duration - 5 weeks
Lectures/Laboratories - 9 hours/week

**NASC 3303 (Bridge Watchkeeping)**

Bridge watchkeeping is the most important activity conducted at sea. The Officer of the Watch (OW) is the Master’s representative and is responsible for the security of the ship and all those aboard. The OOW needs to be proficient in navigation, have a fluent understanding of the Collision Regulations, know how to use the radar/ARPA, be familiar with the bridge instruments, know the ship and its routines, be able to respond to emergencies, handle communications, maintain records correctly and be able to work as a member of the bridge team.

This course provides students with an opportunity to build on previous knowledge and training and to practice watchkeeping skills in a simulated environment.

*Introduction; Maneuvering Data; Bridge Organization; Voyage Preparation; Officer of the Watch (OW); Emergencies; Simulation*

Prerequisites - WKTM 2102
Duration - 8 days (56 hours)

**NASC 3310 (Transport Canada OOW Exam Preparation)**

This course is intended to prepare the student to sit for Transport Canada’s OOW – Oral examination. The oral examination is administered by a Transport Canada Marine Safety and Security Examiner at a Transport Canada Marine Safety and Security examination center. Candidates must be able to demonstrate the ability to apply the knowledge outlined in the oral examination syllabus by appropriate responses, anticipations and reactions to a range of routine, non-routine and contingency scenarios as presented by the examiner, from the perspective of the duties and responsibilities associated with the Officer of the Watch certificate.

*Watchkeeping Principles; Marine Seafarer; Meteorology; Ship Handling Principles; Steering Control Systems; Anchoring and Mooring Procedures; St-Lawrence Seaway Transit; Cargo Operations; Emergency Response; IMO Conventions; Search and Rescue (SAR) Operations; Normal and Emergency Communications; Damage Inspection and Reporting; Preparation for Adverse Conditions; Canadian Legislation, Regulations and Vessel Documentation; Deck Machinery; Knots and Splices; Rigging*

Prerequisites - NASC 3211 (Seamanship III); WKTM 2102 (Sea Phase II)
Duration - 3 hours over a two-week period

**OMAP 2000 (Underwater Acoustic Applications)**

This course is designed to introduce students to the principles and applications of acoustic remote sensing with specific emphasis on its utilization in the marine environment.

*Introduction; Principles; Applications*

Prerequisites - None
Duration - 13 weeks
Lectures - 2 hours/week = 28 hours total
Laboratories - 2 hours once per week x 10 weeks = 20 hours total

**OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing)**

This course provides the student with an introduction to the theoretical, technical and practical application of Side Scan Sonar and Geophysical Remote Sensing systems and techniques. The class will be taught using modern equipment and methodologies, allowing the student to better understand the benefits and limitations associated with this technology, from data acquisition to data dissemination.

*Introduction to Side Scan Sonar; Fundamentals of Underwater Acoustics; Side Scan Sonar Fundamentals; Side Scan Sonar Survey Techniques; Trends in Side Scan Sonar Technology; Introduction to Sub Bottom Profiling; Sub Bottom Record; Return Signal Amplification; Sub Bottom Profiler Design Characteristics; Underwater Acoustic Environments; Sub Bottom Profiler Data Interpretation; Trends in Sub Bottom Profiler Technology; Introduction to Magnetometers; Principles of Magnetometer Surveys; Magnetic Survey Data; Magnetic Survey Problems; Combined Side Scan Sonar and Magnetometer Surveys; Side Scan Sonar and Magnetometer Towing Best Practices; Introduction to Marine Gravimetry*

Prerequisites - OMAP 2000 (Underwater Acoustics Applications)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratories - 2 hours/week = 26 hours

**OMAP 2201 (MultiBeam Sonar)**

This course provides the student with an introduction to the theoretical, technical and practical application of multi-beam sonar systems and techniques. The course will be taught using modern equipment and methodologies, allowing the student to better understand the benefits and limitations associated with this technology, from data acquisition to data dissemination.

*Introduction to MultiBeam Sonar; Fundamentals of MultiBeam Echosounding; Seabed Bathymetry and Acoustic Backscatter; MultiBeam Echosounding Process; MultiBeam Echosounding Methods; MultiBeam Echosounder System Installation; MultiBeam Echosounding Survey Design; Future Trends in MultiBeam Echosounding Technology*

Prerequisites - OMAP 2000 (Underwater Acoustics Applications)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratories - 2 hours/week = 26 hours

**OMAP 2300 (Field Deployment and Data Collection)**

This is a practical field course on-board a hydrographic survey vessel. It is designed to give students the experience of safely deploying and operating hydrographic data collection systems. Students will collect, evaluate, and format hydrographic data for the post-processing delivery stage.

*Marine Safety and Vessel Orientation; Vessel Navigation; Calibration of Data Collection Systems; Single Beam Sonar Data Collection; Sub Bottom Data Collection; Side Scan Sonar Data Collection; Multibeam Sonar Data Collection; Data Delivery*

Prerequisites - OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); OMAP 2201 (MultiBeam Sonar)
Co-requisites - OMAP 2301 (Data Processing and Visualization)
Duration - 7 days
OAP 3101 (System Performance)
This course provides the student with the ability to understand and quantify the capabilities and limitations of underwater acoustic data collection systems. Principles of Measurements and Associated Errors; Fundamentals of Total Pressure and Uncertainty; Review of Acoustic Principles; System Parameter Definitions; Positioning and Attitude System Performance; Water Level Measurement System Performance; Oceanographic Measurement System Performance; Mechanical Depth Measurement System Performance; Single Beam Sonar System Performance; Sub Bottom Profiling System Performance; Sidscan Sonar System Performance; Bathymetric Sidscan Sonar System Performance; Multibeam Sonar System Performance; Oceanographic Depth Measurement System Performance; Future Performance of Hydrographic Data Collection
Prerequisites - OAP 2000 (Underwater Acoustics Applications); OAP 2200 (Sidscan Sonar and Geophysical Remote Sensing); OAP 2201 (Multibeam Sonar) Duration - 13 weeks Lectures - 3 hours/week = 39 hours Laboratories - hours/week = 26 hours

OAP 3200 (International Law of the Sea: Geomatics Perspectives)
This course will familiarize students with the technical aspects of the United Nations Convention on the Law of the Sea (UNCLOS). Students will apply Geomatics principles in definitions of baselines, territorial sea, the EEZ, and the definition of the continental margin as defined in UNCLOS. Introduction to United Nations Convention on the Law of the Sea (UNCLOS); Baselines; Outer Limits; Bilateral Boundaries; The Area; Hydrography and...
Prerequisites - GEOG 1301 (Surveying and GIS) or equivalent Duration - 13 Weeks Lectures - 3 hours per week = 38 total hours

OAP 3201 (Applications of Underwater Acoustic Data)
This course will provide the student with a basic knowledge of the scientific, engineering, military, and resources management-related uses of underwater acoustic data. Students will be exposed to the terminology, concepts and background related to the various disciplines that are currently using underwater acoustic data. Students will develop a general understanding of the needs of various consumers of underwater acoustic data and will be informed on current research trends and engineering applications of the technology. Students will also learn to independently carry a small research project using acoustic data. The Development of Underwater Acoustics; Scientific Applications of Underwater Acoustics Data; Engineering Applications of Underwater Acoustic Data; Resource Management Applications of Underwater Acoustic Data; Military Applications of Underwater Acoustic Data; Future Directions in Underwater Acoustic Data Application
Prerequisites - ONGR 1200 (Descriptive Oceanography); or equivalent; ONGR 2107 (Marine Geology and Geophysics); or equivalent; OAP 2200 (Sidscan Sonar and Seismic Remote Sensing); or equivalent; OAP 2201 (Multibeam Sonar); or equivalent Duration - 13 weeks Lectures - 3 hours per week = 39 total hours Laboratories - 2 hours once per week = 26 total hours

OAP 3202 (Specialized Hydrography)
This course provides the student with an introduction to the theoretical, technical and practical application of specialized industry-related hydrographic practices. These practices will focus on hydrographic support for port management and coastal engineering, offshore geophysical surveying and offshore construction hydrography. The course will be taught using modern equipment and methodologies, allowing the student to better understand the benefits and limitations associated with this technology, from system deployment and data acquisition to data processing, analysis and dissemination. Specialized Hydrography (Fundamentals); Hydrographic Practices for Port Management and Coastal Engineering; Hydrographic Practices for Offshore Geophysical Surveying; Hydrographic Practices for Offshore Construction Hydrography; Future Trends in Specialized Hydrography
Prerequisites - OAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); OAP 2201 (Multibeam Sonar); and ONGR 2107 (Marine Geology and Geophysics) Duration - 13 weeks Lectures - 3 hours per week = 39 total hours Laboratories - 2 hours once per week = 26 total hours

OAP 3300 (Advanced Survey Design and Implementation)
This is a practical field course on-board a hydrographic survey vessel. Students will experience planning and managing a hydrographic survey. Students will build upon the skills gained in OAP 3300 through further experience in safely deploying and operating hydrographic data collection systems. Students will collect, evaluate, and format hydrographic data for the post-processing delivery stage. Marine Safety and Vessel Orientation; Hydrographic Survey Planning; Vessel Navigation; Calibration of Data Collection Systems; Single Beam Sonar Data Collection; Sub Bottom Profiler Data Collection; Side Scan Sonar Data Collection; Multibeam Sonar Data Collection; Shoreline Feature Positioning; Data Delivery
Prerequisites - OAP 2300 (Field Deployment and Data Collection); OAP 3301 (Data Processing and Visualization) Co-requisite - OAP 3301 (Advanced Data Processing and Visualization) Duration - 7 days

OAP 3301 (Advanced Data Processing and Visualization)
This course builds upon knowledge and skills gained in OAP 2301 and provides the student with opportunities for further practice and advanced application of the technical capabilities associated with acoustic data processing and visualization. Single Beam Echosounder Data Processing; Sub Bottom Profiler Data Processing; Side Scan Sonar Data Processing; Multibeam Echosounder Data Processing: Uncertainty Surface Production; Positioning Data Processing; Metadata Attribution; Statistical Analysis; Data Visualization and Dissemination
Prerequisites - OAP 2300 (Field Deployment and Data Collection); OAP 2301 (Data Processing and Visualization) Co-requisite - OAP 3300 (Advanced Survey Design and Implementation) Duration - 10 days

OAP 3400 (Ocean Mapping Data Management Project I)
This course is designed to provide students with the opportunity to develop an understanding of marine data collection and management. It will encompass the vast array of data pertaining to the dynamic marine environment. Students will produce metadata that is compliant with ocean mapping standards and will collect, interpret and disseminate temporal and spatial data sets pertaining to multidimensional marine data types. Data Management, Marine Points, Marine Lines, Marine Surface Data, Ancillary Marine Data
Prerequisites - GEOG 3101 (Mapping and GIS); GEOG 3200 (Remote Sensing); OAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); and OAP 2201 (Multibeam Sonar) Duration - 13 weeks Lectures - 3 hours per week = 39 total hours Laboratories - 2 hours once per week = 26 total hours

OAP 3401 (Ocean Mapping Data Management Project I)
This course is designed to provide students with the required knowledge to conceptualize and manage an ocean mapping project. Students will also be exposed to spatial data infrastructure and metadata standards related to multidimensional marine data types. This course is structured so that, by the end, students will have completed a formal project proposal, which they will then implement in OAP 3501. Project Development; Project Data Scoping; Specifications and Management; Marine Data Types
Prerequisites - GEOG 2102 (Mapping and GIS); GEOG 2200 (Remote Sensing); OAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); and OAP 2201 (Multibeam Sonar) Duration - 13 weeks Lectures - 2 hours per week = 26 total hours

OAP 3500 (Advanced Tides and Water Levels)
This course provides the student with the opportunity to build upon introductory knowledge previously acquired and become familiar with advanced tides and water level theory. The student will become familiar with and be able to utilize the concepts of surface water levels and their controls including tides, waves and swells and vertical reference surfaces. The design of vertical measurement systems using advanced GPS techniques will also be covered as well as an introduction to coastal hydrodynamic modelling as it relates to vertical surfaces. Vertical Datums and Reference Surfaces; Tide Generation Forces; Oceanographic Remote Sensing; Tidal Constituents; Development of Tidal Predictions; Non Tidal Sea Level Variation; Establishment of Tidal Datums; Tidal Zoning; Water Level Measurement Systems Design and Use; GPS Water Level Measurement Systems Design and Use; Spacebased Water Level Measurement; Introduction to Coastal Hydrodynamic Modelling
Prerequisites - OAP 1302 (Hydrology and Tides) Duration - 13 weeks Lectures - 3 hours per week = 39 total hours Laboratories - 2 hours once per week = 26 total hours

OAP 3501 (Ocean Mapping Data Management Project II)
This course follows successful completion of OAP 3401 where students identified an ocean mapping project and completed a proposal. In this course, students will develop skills in data compilation, conversion, techniques and management. Students will produce metadata that is compliant with ocean mapping standards and will collect, interpret and disseminate temporal and spatial data sets pertaining to multidimensional marine data types culminating in a final project. Project Data Scoping, Specifications and Management; Data Formats; Project Development
Prerequisites - OAP 3401* NOTE: There must be no longer than a three-semester period between completing OAP 3401 and registering for OAP 3501. If there is a longer period of time between these two courses, students must repeat OAP 3401 Duration - 13 weeks Laboratories - 2 hours twice per week = 52 total hours

ONGR 1200 (Descriptive Oceanography)
This course is designed to introduce students to the physical principles that create oceanographic processes and to provide an integrated view of the whole field of oceanography. A theoretical introduction to the equipment used in ocean research will be provided. Introduction to Oceanography; Physical Properties of the Ocean; Chemical Properties of the Ocean; Biological Properties of the Ocean; Atmospheric Effects; Currents; Waves; Tides. Duration - 13 weeks Lectures - 3 hours per week = 39 total hours Sea Time - One 3 hour session
COURSE DESCRIPTIONS

ONGR 1201 (Meteorology I)
- This is an introductory course which teaches fundamental meteorological theory and links the concepts to shipboard practice.
- The atmosphere; Transfer of Heat; Temperature; Atmospheric Moisture and Changes of State; Atmospheric Instability/Instability; Fog; Clouds; Precipitation; Thunderstorms; Pressure and Pressure Systems; Winds and Weather Charts.
- Duration: 13 weeks
- Lectures: 4 hours/week = 52 hours total
- Laboratories: 2 hours/week every other week = 12 hours total

ONGR 1300 (Hydrography and Tides)
- This course is designed to provide students with an understanding of hydrographic survey specifications and planning with respect to tide and water levels. It will introduce students to the principles and characteristics of tidal influence as exhibited in hydrographic surveys. Also, the course will provide students with practical operation of instruments used for sea level measurement.
- Introduction to Hydrography; Tides and Water Levels; Water Level Flow and Tidal Currents; Vertical Datums; Harmonic Analysis and Tide Prediction; Instruments for the Measurement of Sea Level
- Duration: 5 weeks
- Lectures: 3 hours/week
- Laboratories: 2 hours/week

ONGR 1301 (Instrumentation Oceanography)
- This course is designed to introduce students to the application of oceanographic data collection including configuration and deployment of appropriate instrumentation packages, as well retrieval and analysis of the data collected.
- Introduction to Oceanographic Measurement Instruments; Introduction to Maps and Projections; Oceanographic Data Collection; Oceanographic Data Pre-Processing; Plotting and Presenting Data on Map Projections
- Duration: 6 weeks
- Lectures: 2 hours per week = 12 total hours
- Laboratories: 6 hours per week = 36 total hours

ONGR 1302 (Hydrography and Tides)
- This course is designed to provide students with an understanding of hydrographic survey specifications and planning with respect to tide and water levels. It will introduce students to the principles and characteristics of tidal influence as exhibited in hydrographic surveys. Also, the course will provide students with practical operation of instruments used for sea level measurement.
- Introduction to Hydrography; Tides and Water Levels; Water Level Flow and Tidal Currents; Datums; Inland Water Hydrography; Harmonic Analysis and Tide Predictions; Instruments for the Measurement of Sea Level

Prerequisite: None
- Duration: 6 weeks
- Lectures: 3 hours per week = 18 total hours
- Laboratories: 2 hours twice per week = 24 total hours

ONGR 2100 (Hydrography)
- An introductory course which explores the field work of the hydrographic surveyor and introduces the student to the complexities involved in producing a finished nautical chart.
- Introduction: Plane Surveying; Geodesy; Projections
- Prerequisites: NASC 1204 (Seamanship II)
- Co-requisites: NASC 2108 (Navigation)
- Duration: 13 weeks
- Lectures: 1 hour/week
- Laboratories: 2 hours/week

ONGR 2101 (Oceanography)
- This is an introductory course which acquaints the student with fundamental physical, chemical and biological oceanographic concepts.
- Physical Oceanography; Chemical Oceanography; and Biological Oceanography
- Prerequisites: WKTM 1102 (Sea Phase I - Nautical Science); Technical Session II - NASC 2107 (Restricted Operator’s Certificate - Maritime Commercial); NASC 2201 (Basic Tanker Safety); NASC 3101 (Navigation Safety - Collision Requirements)
- Duration: 13 weeks
- Lectures: 3 hours/week

ONGR 2103 (Oceanography)
- An introductory oceanography course designed to cover a variety of topics with emphasis on physical and coastal oceanography and the practical skills necessary to sample this environment.
- Composition of the Oceans; Physical Oceanography; Coastal Processes; and Atmosphere and Climate
- Duration: 13 weeks
- Lectures: 2 hours/week = 26 total hours
- Laboratories: 2 hours once per week = 26 total hours

ONGR 2107 (Marine Geology and Geophysics)
- This course provides the student with an introduction to the fundamentals of marine geology and geophysics. Emphasis will be placed on the geological and geophysical processes that shape the ocean basins and continental margins including the means to acquire, analyze, interpret and disseminate the data.
- An Introduction to Geology; Marine Geology; Marine Geophysics; Geotechnical Capabilities
- Duration: 13 weeks
- Lectures: 3 hours per week = 39 total hours

ONGR 2300 (Instrumentation Oceanography)
- This course is designed to introduce students to the physical and chemical principles that create oceanographic processes with a special emphasis on the equipment used in ocean research.
- Introduction to Oceanography; Introduction to Maps and Projections; Properties of the Ocean; Ocean Sediment; Atmospheric Effects; Currents; Waves; Tides
- Prerequisites: MATH 2101 (Mathematics); PHYS 1200 (Physics); FLDS 2100 (Fluids)
- Duration: 5 weeks
- Lectures: 6 hours/week = 40 hours total
- Laboratories: 2 hours/week = 10 hours total

ONGR 3100 (Meteorology II)
- This course provides an introduction to fundamental meteorological theory and links the concepts to shipboard practice.
- Instruments; The Atmosphere; Pressure; Temperature; Water Vapour; Clouds; Precipitation; Visibility and Fog; Wind; Temperature and Polar Zone Circulation; Tropical and Subtropical Circulation; Organization and Operation of Meteorological Services; Forecasting
- Prerequisites: WKT M 2102 (Sea Phase II - Nautical Science)
- Duration: 13 weeks
- Lectures: 3 hours/week

ONGR 3101 (Meteorology)
- This course builds upon the knowledge and skills gained in ONGR 1201 (Meteorology I).
- Air Masses and the Planetary System of Wind and Pressure; Fronts; Families of Depressions or Extratropical Cyclones; Waves and Swells; Oceanic Currents and Effect on the Climate; Tropical Revolving Storms; Ice Formation and Decay; Ice Detection and Reporting; Weather Messages and Codes; Optimum Weather Routing; Requirements: Synoptic and Prognostic Charts
- Prerequisite: ONGR 1201 (Meteorology I); WKT M 2102 (Work Term 2)
- Duration: 13 weeks
- Lectures: 4 hours/week = 52 total hours

ONGR 3500 (Weather and Climate)
- The atmosphere, ocean and the climate system have been steadily evolving since the planet’s formation 4.6 billion years ago, and the climate we experience today is a result of the joint development of the atmosphere, oceans, land surface and biology (including humans). This course provides the student with a basic understanding of meteorological and climatological concepts and processes. A special focus is put on the interactions between the ocean, the atmosphere, weather and climate at various spatial and temporal scales.
- The atmosphere; Heat Budget and Temperature; Humidity and Condensation; Air Pressure and Wind; Air Masses, Fronts and Weather Systems; Extreme weather; Global Climate and Earth’s Changing Climate; Forecasting
- Prerequisite: ONGR 1200 (Descriptive Oceanography)
- Duration: 13 weeks
- Lectures: 3 hours per week = 39 total hours

ONGR 4101 (Coastal Oceanography and Geomorphology)
- This is an introductory course on General Oceanography and Geomorphology designed to provide the participants with an integral view of the physical, chemical and biological components of the ocean and its interaction with coastal areas of the continent. It will also review the many aspects of climatology and the impacts they have on ocean characteristics.
- Properties of Water and Seawater; Geologic Structure of the Ocean Floor; Seafloor Sediments; Climate and Weather; Atmospheric and Oceanic Circulation; Tropical Storms and Hurricanes; Ocean Waves; Tides
- Duration: 52 hours
- Lectures: 39 hours (3 hours/week)
- Tutorials: 13 hours (1 hour/week)

ONGR 4104 (Coastal Oceanography & Climatology)
- This is an introductory course on General Oceanography and Climatology designed to provide the participants with an integral view of the physical, chemical and biological components of the ocean and its interaction with coastal areas of the continent. It will also review the many aspects of climatology and the impacts they have on ocean characteristics.
- Properties of Water and Seawater; Geologic Structure of the Ocean Floor; Seafloor Sediments; Climate and Weather; Atmospheric and Oceanic Circulation; Tropical Storms and Hurricanes; Ocean Waves; Tides
- Duration: 52 hours
- Lectures: 39 hours (3 hours/week)
- Tutorials: 13 hours (1 hour/week)

ONGR 4300 (Coastal Geomorphology)
- This is an introductory course on Coastal Geomorphology designed to provide the participants with an integral view of the forces, both past and present, which interact with the coast and its features and are responsible for its dynamic physical appearance.
- Introduction to Geomorphology; Coastal Geomorphology; Coastal Erosion and Deposition; Land and Sea Level Changes; Coastal Dunes; Coral Reefs; Man-Made Alterations to the Coast
- Prerequisite: ONGR 4104 (Coastal Oceanography and Climatology)
- Duration: 39 hours
- PHYS 1100 (Physics)
- This is an introductory Physics course designed to extend the students knowledge and understanding of basic Physics principles, concepts and applications related to mechanics. The course also extends abilities in data handling, problem solving and experimentation.
ROVO 2204 (Launch and Recovery Systems or LARS)
This course is designed to introduce students to the basics types, operation and maintenance of Launch and Recovery systems.
Types of LARS: LARS Components and Maintenance; Lift Winches; A-frame Assembly; Control Station; Parking Platform Safety; Rigging; Slinging and Hoisting and Fasteners
Prerequisites - PHYS 1100 (Physics) or PHYS 1101 (Physics); WKPR 2118 (Workshop Practice)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week (6 Labs) = 12 hours total

ROVO 2205 (ROV Maintenance and Launch and Recovery Systems (LARS))
This course is designed to enable students to develop the ability to troubleshoot and repair ROVs and their essentials systems. It is inherent to underwater robotics technology as well as to introduce them to the basic types, operation and maintenance of Launch and Recovery systems.
Types of Launch and Recovery Systems (LARS): LARS Components and Maintenance; Lift Winches; A-frame Assembly; Control Station; Parking Platform Safety; Rigging; Slinging, and Hoisting; Troubleshooting and Maintenance of Electrical/Electronic Hardware; Troubleshooting and Maintenance of Hydraulic/Mechanical Hardware; Preventative Maintenance Regimes
Prerequisites - ELTK 2118 (High Voltage Safety); FLDS 2108 (Introduction to Fluid Statics, Dynamics & Hydraulics); WKPR 2118 (Workshop Practices)
Co-requisite - ELTK 2116 (Industrial Electronics & Controls)
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total
Laboratories - 4 hours per week (Two 2-hour labs per week with a total of 26 Labs) = 52 hours total

ROVO 2300 (ROV Ship Interaction)
This course gives the student an introduction to dynamic positioning (DP) operations on vessels equipped with ROVs. It enables the student to understand the operation of a DP system and to assess the operation of a DP system during ROV operations.
Dynamic Positioning; Dynamic Positioning Principles; Sensors; Dynamic Positioning Applications; Coordinate Systems; Position References; Thrusters and Maneuvering Systems; Dynamic Positioning Modes; Power Management Systems; Dynamic Positioning Operations; Regulations; Dynamic Positioning Control Console
Prerequisites - ROVO 2200 (Introduction to ROV); ROVO 2201 (ROV Operations); ROVO 2202 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application)
Duration - 3 days (21 hours)

ROVO 2301 (ROV Operations)
This course is designed to introduce students to the proficient and safe operation of underwater robotic systems throughout their full range of subsea applications.
Basic Operations; Spheres of Operation; ROV Sub Systems Utilization
Prerequisites - Term 1 ROV Program which include: ELTK 3104 (Electrotechnology); ELTR 3117 (Fabrication); ELTR 3118 (Industrial Electronic and Controls); ELTR 3119 (Data Communications); ENGR 3100 (Blueprint Reading); FLDS 3106 (Introduction to Fluid Statics & Dynamics); FLDS 3107 (Hydraulic Controls); WKPR 3106 (Workshop Practice)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week (13 Labs) = 26 hours total

ROVO 3102 (ROV Maintenance)
This course is designed to generate within the students the ability to troubleshoot and repair any and all malfunctions which are inherent to underwater robotics technology. Troubleshooting and Maintenance of Electrical/Electronics Hardware; Troubleshooting and Maintenance of Hydraulic/ Mechanical Hardware; Preventive Maintenance Regimes.
Prerequisites - Term 1 ROV Program which include: ELTK 3104 (Electrotechnology); ELTR 3117 (Fabrication); ELTR 3118 (Industrial Electronic and Controls); ELTR 3119 (Data Communications); ENGR 3100 (Blueprint Reading); FLDS 3106 (Introduction to Fluid Statics & Dynamics); FLDS 3107 (Hydraulic Controls); WKPR 3106 (Workshop Practice)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week (13 Labs) = 26 hours total

ROVO 3103 (Underwater Acoustic Applications)
This course is designed to introduce students to the Principles and applications of acoustic remote sensing with specific emphasis on its utilization in ROV operations.
Introduction; Principles; Applications
Prerequisites - Term 1 ROV Program which include: ELTK 3104 (Electrotechnology); ELTR 3117 (Fabrication); ELTR 3118 (Industrial Electronic and Controls); ELTR 3119 (Data Communications); ENGR 3100 (Blueprint Reading); FLDS 3106 (Introduction to Fluid Statics & Dynamics); FLDS 3107 (Hydraulic Controls); WKPR 3106 (Workshop Practice)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours biweekly = 12 hours total

ROVO 3104 (Launch and Recovery Systems or LARS)
This course is designed to introduce students to the basic types, operation and maintenance of Launch and Recovery systems.
Prerequisites - Term 1 ROV Program which include: ELTK 3104 (Electrotechnology); ELTR 3117 (Fabrication); ELTR 3118 (Industrial Electronic and Controls); ELTR 3119 (Data Communications); ENGR 3100 (Blueprint Reading); FLDS 3106 (Introduction to Fluid Statics & Dynamics); FLDS 3107 (Hydraulic Controls); WKPR 3106 (Workshop Practice)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week (6 Labs) = 12 hours total

ROVO 3105 (ROV Ship Interaction)
This course gives the student an introduction to dynamic positioning (DP) operations on vessels equipped with ROVs. It enables the student to understand the operation of a DP system and to assess the operation of a DP system during ROV operations.
Dynamic Positioning; Dynamic Positioning Principles; Sensors; Dynamic Positioning Applications; Coordinate Systems; Position References; Thrusters and Maneuvering Systems; Dynamic Positioning Modes; Power Management Systems; Dynamic Positioning Operations; Regulations; Dynamic Positioning Control Console
Prerequisites - Term 2 ROV Program which include: ELTK 3105 (High Voltage Safety); ROVO 3100 (Introduction to ROV Systems); ROVO 3103 (Underwater Acoustic Applications); ROVO 3104 (Launch & Recovery Systems or LARS); ROVO 3101 (ROV Operations); ROVO 3102 (ROV Maintenance)
Duration - 4 days (28 hours)

ROVO 3106 (Pilot Training)
This course is designed to instruct the students in the methods employed to pilot an eyeball class ROV under real world situations involving static and dynamic water environments.
Basic Piloting Protocols; Task Specific Flying Exercises; Flying in Heavy Currents Scenarios
Prerequisites - ROVO Program Term 2: ELTK 3105 (High Voltage Safety); ROVO 3100 (Introduction to ROV Systems); ROVO 3101 (ROV Operations); ROVO 3102 (ROV Maintenance); ROVO 3103 (Underwater Acoustic Applications); ROVO 3104 (Launch & Recovery Systems or LARS)
Duration - 42 hours
**COURSE DESCRIPTIONS**

**ROVO 3107 (ROV Simulator Training)**
This course is designed to instruct the students in the major facets of ROV piloting.
Basic Flying Protocols in Simulated Environments; Simulated Flying Exercises
Prerequisites - ROV Program Term 2 which include: ELTK 3105 (High Voltage Safety); ROVO 3100 (Introduction to ROV Systems); ROVO 3101 (ROV Operations); ROVO 3102 (ROV Maintenance); ROVO 3103 (Underwater Acoustics Applications); ROVO 3104 (Launch & Recovery Systems or LARS)
Duration - 70 hours

**ROVO 3200 (AUV Designs and Operations)**
This course is designed to familiarize the students with the overall systems and subsystems of AUV technology including design, construction, propulsion, control and sensory hardware/software, as well as typical AUV operational tasks.
AUV Shells, Base Structures, and Body Types; Power Supplies, Thrusters, Control Electronics Environmental Sensors, Software Basics; Field Applications and Operations
Prerequisites - (Industrial Electronic and Controls)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

**ROVO 3300 (Remotely Operated Vehicle Survey Operations)**
This course is designed to familiarize students with the piloting and operation of Remotely Operated Vehicles (ROVs) and their associated hardware. It will provide students exposure to working with ROV operations in the supporting role of the ocean mapper.
Survey Data Preparation for ROV Operations; Introduction to ROV Operations; ROV Sonar Familiarization; Ultra Short Baseline (USBL) Equipment Setup and Operation; Practical ROV Piloting Skills; ROV Navigation Using USBL
Prerequisites - OMAP 2000 (Underwater Acoustics Applications)
Duration - 21 hours

**SFTY 0001 (Basic Boat Skills)**
This course is designed to instill workers/participants with an increased awareness and knowledge of the small boat safety and skills related to boating activities. It will include theory and practical skills components for inexperienced workers to orient them to basic navigation, proper handling, docking, loading and other fundamental boat skills.
Types of Hulls; Environmental Forces Acting on a Boat; Propulsion and Steering; Boat Handling Characteristics; Boat Handling Procedures; Boat Handling in Heavy Weather; Navigation; Practical Boat Handling
Duration - 6 days

**SFTY 0200 (Workplace Safety Skills)**
This course provides participants with the knowledge and practical skills necessary to perform their duties safely within their workplace.
Occupational Health and Safety Act – Laws and Regulations, Workplace Health and Safety Responsibilities, Safety Committee, Employee Rights, Workplace Diversity, Duties of Safety Officers, Civil Law Implications, and Accident and Incident Reporting
Duration - 13 weeks
Lectures - 2 hours/week
Laboratory - 1 hour/week

**SFTY 1100 (Marine Emergency Duties)**
SFTY 1100 (A1 - Basic Safety)
This course is designed to provide seafarers with the minimum knowledge of emergency response required to safely work aboard a vessel. It includes the Transport Canada course syllabus in Marine Publication TP 4957.
Introduction and Safety; Hazards and Emergencies; Emergency Response; Firefighting; Lifesaving Appliances and Abandonment; Survival; Rescue
Prerequisites - Marine institute approved medical clearance
Duration - 20 hours - 3 days
Theory - 12 hours
Practical - 8 hours

**SFTY 1100 (Marine Emergency Duties)**
SFTY 1100 (B1 - Survival Craft)
This course is intended to train individuals in personal marine survival techniques, and in the use of survival craft to an extent appropriate to the functions of crew members of ships. It complies with or exceeds the requirements of Transport Canada’s (Marine Safety Directorate), Marine Emergency Duties B1.
Survival Craft and Launching Systems; Small Team Leadership Techniques; Abandoning and Practical Boatwork; Survival; Distress Signals; and Rescue
Duration - 35 hours
Lectures - 15 hours
Practical - 20 hours

**SFTY 1100 (Marine Emergency Duties)**
SFTY 1110 (B2 - Marine Firefighting)
This is a basic firefighting course which introduces the student to both the theoretical and practical aspects of Marine firefighting.
Fire Science; Cause and Prevention; Equipment; Construction and Arrangement; Firefighting Procedures; Fixed Fire Detection and Extinguishing Systems
Duration - 5 days
Theory - 15 hours
Practical - 14 hours

**SFTY 1101 (Standard First Aid)**
An approved training provider will deliver this two-day course.

**SFTY 1102 (Marine Basic First Aid)**
STCW A-V/1-3
This is a basic first aid training course for seafarers that meets IMO: STCW Regulation VI/4 and STCW Code Section A-V/4, and requirements under TP 13008 Training Standards for Marine First Aid and Marine Medical Care. This course is designed so that seafarers would acquire immediate basic first aid in the event of an accident or illness onboard a vessel.
General Principles, Body Structure and Functions, Positioning of Casualty, the Unconscious Casualty, Resuscitation, Control Bleeding, Management of Shock, Burns, Scalds, and Accidents caused by Electricity, Rescue and Transport of Casualty, Fractures, Dislocations, and Muscular Injuries, Medical Emergencies, Head and Spine Injuries, Wounds, Heat and Cold Related Emergencies, Poison, Bites and Stings, Other Topics.
Prerequisites - None
Duration - 17 hours
Theory - 10 hours
Practical - 7 hours

**SFTY 1103 (Transportation of Dangerous Goods Initial (Road))**
This course is designed to provide training for all persons involved in the Handling, Offering for Transport, and/or Transporting of Dangerous Goods.
Introduction to TDG, Classification, Shipping Document, Safety Marks, Containers, Special Situations, Emergency Actions.
Duration - 6 hours

**SFTY 1104 (WHMS)**
This is an introductory course designed to inform students about the Workplace Hazardous Materials Information System (WHIMS)
Workplace Hazardous Materials Information System; Regulations; Chemical Hazards; Labelling; Material Safety Data Sheets; Confidential Information
Duration - 4 hours

**SFTY 1105 (MED C - Officer Certification)**
This Marine Emergency Duties course is designed for junior officers and key personnel. It gives the student the knowledge and skills necessary to inspect, maintain, and effectively utilize their equipment to respond to any shipboard emergency.
The course is approved by Transport Canada and meets the international convention on standards of training certification and watchkeeping for seafarers (STCW 1978). Deck officers and engineering officers requiring a Continued Proficiency Endorsement are required to complete this course.
Fixed Fire Detection and Extinguishing Systems; Inspection and Maintenance of Emergency Equipment; Response of Bridge, Deck, and Engine Room Watch to Emergencies;

**COURSE DESCRIPTIONS**

**Emergency Response Team Leadership; Firefighting On-scene Leader Plan of Attack; Incident Reporting; Crowd Management; Search and Rescue; Internal Communications; Conduct of Training Sessions**
Prerequisite - Successful completion of Marine Emergency Duties Training Course SFTY 1110 (B1-Survival Craft), and Marine Emergency Duties Training SFTY 1111 (B2 - Marine Firefighting) in the past five years (Recommendation)
Duration - 21 hours
Theory - 16 hours
Practical - 5 hours

**SFTY 1106 (Marine Advanced First Aid (STCW A-V/4-I)**
This is an advanced first aid training course for seafarers that meets IMO: STCW Regulation VI/4 and STCW Code Section A-V/4, and requirements under TP 13008 Training Standards for Marine First Aid and Marine Medical Care. This course is designed for seafarers who would apply immediate advanced first aid in the event of an accident or illness onboard a vessel.
Prerequisite - None
Duration - 38 hours
Theory - 19 hours
Practical - 16 hours

**SFTY 1114 (Basic Safety - STCW95 VI/1)**
This is a basic safety training course for seafarers which meets IMO: STCW Regulation VI/1 and STCW Code Tables A-VI/1-1, 1-2, and 1-4, and requirements under TP 4057 in Marine Personnel Regulations in Basic Safety and in Marine Fire Fighting.
Introduction and Course Safety; Hazards, Emergencies, Emergency Preparedness and Response, Pollution Prevention; Fire Fighting Theory; Fire Prevention and Control Aboard Ships; Shipboard Fire Fighting Organization and Training; Practical Fire Fighting; Vessel Care and Fire Fighting Equipment; Lifesaving Equipment and Abandoning; Survival; Communications; Rescue; Safe Working Practices; Effective Human Relations on Board Ship.
Prerequisite - Marine institute approved medical clearance; Marine Institute approved fit testing
Co-prerequisite - Marine Basic First Aid or Marine Advanced First Aid
Duration - 43 hours
Lecture - 21 hours
Practical - 22 hours
COURSE DESCRIPTIONS

SFTY 1115 (Basic Survival Training)
This is a basic course designed to provide personnel with an understanding of the hazards associated with working in an offshore environment, the knowledge and skills necessary to react effectively to offshore emergencies and to care for themselves and others in a survival situation.

Hazards, Emergencies and Safety; Emergency Preparedness and Response; Firefighting; Personnel Buoyancy Apparatus; Personal Transfer Devices; Evacuation; Survival Craft and Launching Systems; Survival; Signaling Devices; Search and Rescue; Helicopter Safety and Emergency Procedures

Prerequisite - Medical Clearance in accordance with MI policy.
Duration - 40.0 hours (5 days)
Theory - 17.5 hours
Practical - 22.5 hours

SFTY 1116 (Tanker Familiarization)
This is an introductory level course designed for non-certified ratings so that they may understand the hazards associated with working in a tanker environment. It also provides them with the knowledge required to work safely in this environment.

This course meets and/or exceeds the standards set down in Transport Canada TP9218E and STCW 95.

Tankers; Cargo; Toxicity; Hazards; Hazard Control; Personal Safety and Protective Equipment; and Pollution Prevention

Duration - 28.0 hours (4 days)
Theory - 24.0 hours
Practical - 4.0 hours

SFTY 1117 (Survival Craft - STCW95 V12)
This course is designed to meet STCW95 V12 Training in Survival Craft and Rescue Boats, other than Fast Rescue Boats, and Canadian requirements under the Marine Personnel Regulations for training of marine personnel. Participants will advance their knowledge of marine survival craft and associated equipment as well as prepare to manage crew and passengers during abandoning of a vessel, surviving at sea, and being rescued.

Introduction and Safety; Emergency Situations; Principles of Survival; Use of Personal Survival Equipment; Helicopter Rescue; Survival Craft and Rescue Boats; Launching Arrangements; Lifeboat Engine and Accessories; Evacuation; Signalling Equipment and Pyrotechnics; Action Aboard a Survival Craft; Launching and Recovering Lifeboats; Life Raft Launching; Launching and Handling Survival Craft in Rough Weather; Radio Equipment

Prerequisites - Marine Institute approved medical clearance; SFTY 1108 (A1 - Basic Safety); SFTY 1109 (MED A2 - Small Vessel Safety), or SFTY 1114 (Basic Safety-STCW95 VII)
Duration - 28 hours
Lectures - 12 hours
Practical Exercises - 16 hours

SFTY 1118 (Advanced Firefighting & Officer Certification - STCW95 V11)
This is an advanced Marine Fire Fighting course designed to meet STCW Regulation V11/Advanced Fire Fighting and requirements under the Canadian Marine Certification Regulations up to the Chief Officer/Second Engineer level.

Introduction, Safety and Principles; Training of Seafarers in Fire Fighting; Fire Fighting Process Hazards; Ventilation Control Including Smoke Extraction; Monitoring and Control of Stability During Fire Fighting; Response of Bridge, Deck and Engine Room Watch Officers to Emergencies; Emergence Response Team Leadership; Plan of Attack for On-scene Fire Fighting Leaders; Coordination of Shipboard Fire Fighting; Coordination with Shore-Based Fire Fighters; Management and Control of Injured Persons;

Fire Detection and Extinguishing Installations; Inspection and Maintenance of Emergency Equipment; Incident Investigation and Reporting; Crowd Management; Search and Rescue; Communications

Prerequisite - Medical Clearance according to Marine Institute policy; Completion of SFTY 1114 (Basic Safety - STCW95 VII); Completion of SFTY 1117 (Survival Craft - STCW95 V12) or SFTY 1108; SFTY 1110 & SFTY 1111; Marine Institute Approved Fit Testing
Duration - 36.5 hours
Lecture - 18.5 hours
Practical Exercises - 18.0 hours

SFTY 1119 (Small Boat Navigation for Seamanship)
This course is a combination of two approved short courses - MED A3 (Small Vessel Safety) and Small Vessel Operator - Commercial/Fishing Vessels Training and Certification

Duration - 3 hours
Lecture - 7.5 hours
Practical - 7.5 hours

SFTY 1120 (Confined Space Awareness)
This is an introductory course designed to provide students with an awareness of confined space issues and to familiarize them with self-contained breathing apparatus.

Confined Spaces, Detection Equipment, Purging and Ventilating, Entry Procedures, Confined Space Rescue, and Psychological Aspects of a Confined Space, Self-Contained Breathing Apparatus

Duration - 8 hours
Theory - 6 hours
Practical - 2 hours

SFTY 1121 (Equipment and Site Safety)
This is an introductory course designed to provide students with an awareness of site safety and to familiarize them with basic site evaluation skills and the equipment used on remediation sites.

Occupational Health and Safety Act; The Work Site

Duration - 7 hours

SFTY 1122 (Confined Space Entry Awareness) - To be delivered after SFTY 1123
This is an introductory course designed to provide students with an awareness of marine confined space issues and to familiarize them with a selection of specialized equipment required for safe entry into confined spaces.

Confined Spaces, Atmospheric Assessment, Purging and Ventilating, Entry Procedures, Respiratory Protection, Confined Space Entry Safety Equipment

Duration - 7 hours
Theory - 4 hours
Practical - 3 hours

SFTY 1125 (Small Vessel Operator Proficiency)
This course is designed to provide candidates with the skills and knowledge to act as the operator of commercial vessels up to 5 gross tonnage, other than tugs, and fishing vessels, and for fishing vessels up to 15 gross tonnage or 12 meters overall length engaged on a near coastal, class 2 or a sheltered waters voyage.

This course has been developed in accordance with the Transport Canada Marine Safety TP 14692 E.

Introduction; Terminology; Vessel Hull Types and Configurations; Seamanship; Collision Avoidance Regulations; Stability; Safety on the Marine Weather; Navigation, Positioning Equipment and Installations; Power Boat Operations; Search and Rescue (SAR) Resources; Protection of the Marine Environment; Departure Preparation; Quick Reference Checklists

Duration - 28 hours

SFTY 1126M (Standard First Aid with Level C-CPR and AED)
An approved training provider will deliver this three-day course.

SFTY 1127 (Passenger Safety Management)
This course is designed to provide students with standards for familiarization and basic safety training as well as competencies to cope with such hazards and emergencies to the extent appropriate to their functions onboard passenger-carrying vessels. It will also provide seafarers with an understanding of measures to be taken in order to ensure safe operation of passenger-carrying vessels.

Introduction; Crew Management Training; Safety Training for Personnel Providing Direct Service to Passengers in Passenger Space; Passenger Safety Training; Crisis Management and Human Behaviour Training

Duration - 12.5 hours
Lectures - 9.5 hours
Laboratory - 3 hours

SFTY 1128 (Basic Survival Training)
This is a basic course designed to provide personnel with an understanding of the hazards associated with working in an offshore environment, the knowledge and skills necessary to react effectively to offshore emergencies and to care for themselves and assist others in a survival situation.

Working Offshore; Helicopter Safety & Emergency Procedures; Fire Safety; Abandonment & Survival; Survival Craft; Search & Rescue

Prerequisite - Marine Institute approved medical clearance; Duration - 40 hours (5 days)
Theory - 17.5 hours
Practical - 22.5 hours

SFTY 1129 (Security Awareness Training for Seafarers with Designated Security Duties)
This course provides knowledge to those who may be designated to perform the duties and responsibilities of seafarers with designated security responsibilities, as defined in Table A-VI/2 of the STCW Code, and in particular the duties and responsibilities with respect to assisting the Vessel Security Officer in enhancing the security of a vessel.

Introduction; Maritime Security Policy; Security Responsibilities; Ship Security Assessment; Security Equipment; Threat Identification, Recognition and Response; Vessel Security Actions; Emergency Preparedness, Drills, and Exercises; Security Administration

Lectures - 9.5 hours
Practical - 3.5 hours
Exam - 1.0 hours
Total - 12.5 hours
SFTY 1130 (Introduction to Transportation of Dangerous Goods (TDG))
This is an introductory course designed to provide students with an awareness and understanding of the Transportation of Dangerous Goods Act and Regulations and the classifications, shipping requirements, safety requirements, and emergency measures and actions needed in the transportation of dangerous goods in Canada. Introduction to TDG; Transportation of Dangerous Goods Act; TDG Regulations; Manual Layout; Classification; Documentation; Dangerous Goods Safety Marks; Means of Containment; Training Requirements; Emergency Actions; Transportation Modes / Inspectors
Duration: 2 days (14 hours Lecture)

SFTY 1134 (Security Awareness Training for Seafarers without Designated Security Duties)
This course provides knowledge and familiarization awareness training to all persons employed or engaged on a seagoing vessel compliant with the requirements of the ISPS Code, other than passengers, as defined in Table A-VI/6-1 of the STCW Code, and section 214 of the Canadian MSTR, and in particular the duties and responsibilities with respect to assisting the Vessel Security Officer in enhancing the security of a vessel.
Introduction; Maritime Security Policy; Security Responsibilities; Threat Identification, Recognition, and Response; Vessel Security Actions; Emergency Preparedness, Drills, and Exercises
Prerequisite: None
Duration: 6.0 hours
Lectures: 5.25 hours
Test: 0.75 hours

SFTY 1135 (Practical Boat Handling Skills)
This course is designed to enable students to gain practical experience in handling a small boat on the water. Basic Procedures; Maneuvering Procedures; Un-docking a Boat; Docking a Boat; Retrieving an Object from the Water; Anchoring a Boat
Co-requisite: SFTY 1125 (Small Vessel Operator Proficiency)
NOTE: SFTY 1125 is listed as a co-requisite to allow for students to register for both courses in the same semester, however, SFTY 1125 must be completed prior to starting this course.
Duration: 2.5 hours sessions (7 hours total)

SFTY 2100 (Small Craft Safety & Boat Handling)
This is an introductory course in the principles and practices of small boat safety and handling. Boat Safety; Legislation; Safety Equipment; Stability; Deckwork; Towing; Emergency Procedures
Duration: 35 hours

SFTY 2101 (H2S ALIVE)
Information will be distributed by the instructor.
H2S Alive Petroleum Industry Training Service Certificate

SFTY 2102 (MED A3 - Marine Emergency Duties for Small Vessels)
This is a marine emergency duties course designed for crew members of non-pleasure vessels of not more than 150GT which operate not more than 20 miles from shore.
Introduction and Course Safety; Hazards and Emergencies; Emergency Prevention, Preparedness, and Response; Firefighting; Lifesaving Appliances and Abandoning; Survival; Signalling; Rescue
Duration: 14 hours
Lecture: 10 hours
Practical: 4 hours

SFTY 2200 (Small Boat Navigation for Cruise Planning)
This course is designed to enable participants to understand and apply the fundamental principles of coastal navigation for small boats.
The Coordinate System; Basic Tools of the Trade; Compass Work; Chartwork Skills; Global Positioning System; Publications; Cruise Planning
Prerequisite: MATH 1100
Duration: 30 hours

SFTY 2201 (Boating - Practical Skills)
This course is designed to enable participants to develop and apply fundamental practical skills for use with small boats.
Basic Tools of the Trade; Compass Work; Chartwork Skills; Global Positioning System; Cruise Planning; Knots and Basic Sailing
Duration: 26 hours (2 hours lab per week)

SFTY 2300 (Small Boat Navigation for Marine Sampling)
This course is designed to enable participants to apply the fundamental principles of basic coastal navigation to the operation of a small boat in coastal marine waters while sampling.
Cruise Planning; Electronic Instrument Set-up; Pre-departure Checks; Passage Monitoring; Station Keeping
Prerequisite: SFTY 2201 (Boating Practical Skills)
Duration: 35 hours

SFTY 2301 (Fall Protection)
This course will enable the participant to identify and safely use the proper equipment for fall protection in the workplace.
This course will meet the Fall Protection Certification Training Standard for Workplace Health and Safety Compensation Commission (WHSCC).

SFTY 2103 (Statistics - Water Quality)
This is a course designed to familiarize students with modern statistical methods and guidelines for the analysis of water quality/ biological data.
Introduction; Numerical Methods for Describing Sets of Data; Exploratory/Graphical Data Analysis; Probability and Probability Distributions; Inferences Based on a Single Sample: Point Estimation; Statistical Inference: Tests of Hypotheses; Analysis of Variance: One-Factor; Analysis of Variance: Two-Factors; Regression and Correlation
Prerequisite: One university or college level introductory statistics course, or equivalent
Lectures: 26 hours (2 hours per week)

SFTY 2302 (Statistics for Coastal Zone Management)
This course will provide the participants with the necessary statistical tools for decision making in Coastal Zone Management.
Descriptive Statistics; Data Collection and Surveys; Statistical Inference
Duration: 13 weeks
Lectures: 2 hours/week
Laboratories: 2 hours/week

COURSE DESCRIPTIONS

STAT 4105 (Statistics - Aquaculture)
This course is designed to familiarize students with modern statistical methods and guidelines for the analysis of aquaculture/ ecological data.
Introduction; Numerical Methods for Describing Sets of Data; Exploratory/Graphical Data Analysis; Probability and Probability Distributions; Inferences Based on a Single Sample: Point Estimation; Statistical Inference: Tests of Hypotheses; Analysis of Variance: One-Factor; Analysis of Variance: Two-Factors; Regression and Correlation
Prerequisite: One university or college level introductory statistics course, or equivalent
Lectures: 39 hours (3 hours per week)
Laboratories: 26 hours (2 hours per week)

STAT 4106 (Applied Statistics for Food Safety)
This course is designed to familiarize students with modern statistical methods and guidelines for the analysis of food safety/ production data and to provide an introduction to statistical process control methods.
Introduction; Numerical Methods for Describing Sets of Data; Normal Distributions; Inferences Based on a Single Sample: Point Estimation; Statistical Inference: Tests of Hypotheses; Analysis of Variance; Regression and Correlation; Discrete Probability Distributions; Acceptance Sampling; Statistical Process Control
Prerequisite: One university or college level introductory statistics course, or equivalent
Lectures: 39 hours
Laboratories: 26 hours

STWK 0107 (Welding Theory I)
This introductory course is designed to familiarize the student with the theoretical aspects of welding.
Introduction to Trade; Safety; Oxy-Fuel Cutting, Fusion, Brazing and Braze Welding (Oxy-Fuel); SMAW (Shielded Metal Arc Welding) I; Build up of Metal Parts; SMAW II – Filler Weld Flat and Horizontal (Part 1); Metallurgy, Expansion and Contraction Control; Jigs and Fixture Fabrication
Co-requisites: STWK 0108 (Fabrication Theory I); WKP R 0107 (Welding and Fitting Shop)
Duration: 13 weeks
Lectures: 2 hours/week

COURSE DESCRIPTIONS
**STWK 0108 (Fabrication Theory I)**
This introductory course is designed to familiarize the student with the theoretical aspects of steel fabrication.

**Offshore Fabrication Work Environment**; **Safety Requirements**; **Structural Steel**; **Hand Measuring and Layout Tools**; **Procedures Used To Fabricate Various Structural Shapes**; **Hand and Power Cutting Tools**; **Drilling and Threading Tools**; **Grinding and Finishing**; **Bending and Rolling**; **Stationary Powered Shearing**; **Iron Worker Occupation**

**Co-requisites** - STWK 0107 (Welding Theory I); WKPR 0107 (Welding and Fitting Shop I)
**Duration** - 13 weeks
**Lectures** - 2 hours/week

**STWK 0207 (Welding Theory II)**
This intermediate level course is designed to enhance the student’s theoretical knowledge in offshore welding.

**SMAW (Shielded Metal Arc Welding)**; **Grove Weld All Positions**; **Procedures To Test Weks**; **Weld Faults**; **Filet and Grove Welda**

**Duration** - 13 weeks
**Lectures** - 2/0

**STWK 0208 (Welding Theory III)**
This intermediate level course is designed to enhance the student’s theoretical knowledge in offshore steel fabrication.

**Code and Standards**; **Heat Treatment**; **Quality Control and Quality Assurance**.

**Prerequisites** - STWK 0107 (Welding Theory I); STWK 0108 (Fabrication Theory I); WKPR 0107 (Welding and Fitting Shop I)
**Duration** - 13 weeks
**Lectures** - 2/0

**STWK 0300 (Introduction to Apprenticeship)**
This course is designed to give participants the knowledge base and skills necessary to understand and successfully navigate the Apprenticeship/Red Seal Program.

**Apprenticeship Defined**; **How Apprenticeship is Governed and Administered**; **Roles and Responsibilities of Those People Involved in the Apprenticeship Process**; **Steps in the Apprenticeship Program**; **Training and Education Requirements**; **Plans of Training**; **Apprenticeship Progression**

**Duration** - 13 weeks
**Lectures** - 2/0

**TKPR 310A/310B (Technological Project - Marine Engineering Technology)**
The Technological Project is a linked course; TKPR 310A must be completed in the following academic term after TKPR 310A.

**Design Morphology**; **Project Selection**; **Problem Identification**; **Project Research and Planning**; **Project Proposal**; **Project Performance**; **Project Analysis**; **Project Reporting and Presentation**

**Prerequisites** - TKPR 310A: Successful completion of CKMK 1201 (Communication at Work); MREK 2207 (Marine Engineering Knowledge); WKPR 2113 (Welding Shop); WKPR 2116 (Fitting Shop); WKPR 2217 (Machine Shop); WKMT 1103 (Work Term 1); and WKPR 3101 (Machine Shop) & TKPR 310B: Successful completion of TKPR 310A

**Duration** - TKPR 310A - 13 weeks
**Lectures** - 1 hour per week
**Laboratories** - 2 hours per week
**Duration** - TKPR 310B - 13 weeks
**Lectures** - 1 hour per week
**Laboratories** - 2 hours per week

**TKPR 3100A/B (Technological Project - Marine Engineering Technology)**
The Technological Project is a linked course; TKPR 3100B must be completed in the technical session immediately following TKPR 3100A, and TKPR 3100C must be completed in the next academic term after TKPR 3100B. The course is designed for advanced Marine Engineering Technology students to demonstrate the application of knowledge and skills developed throughout the program.

**Design Morphology**; **Project Selection**; **Problem Identification**; **Project Research and Planning**; **Project Proposal**; **Project Performance**; **Project Analysis**; **Project Reporting and Presentation**

**Prerequisites** - TKPR 3100A: Successful completion of CKMK 1201 (Communication at Work); MREK 2207 (Marine Engineering Knowledge); MREK 2207 (Marine Engineering Knowledge); WKPR 1106 (Fitting Shop); WKPR 1107 (Welding Shop); WKPR 1108 (Machine Shop); WKPR 2104 (Fitting Shop); WKPR 2107 (Welding Shop); WKPR 2108 (Machine Shop) and WKPR 3100 (Machinery Maintenance Shop)

**TKPR 3100B - Successful completion of TKPR 3100A**

**Duration** - TKPR 3100A - 13 Weeks
**Lecture/Lab** - 1/2

**TKPR 3100B - 5 weeks**
**Lecture/Lab** - 1/2

**TKPR 3100C - 13 Weeks**
**Lecture/Lab** - 1/2

**TKPR 3108 (Advanced Technical Report Writing)**
The technical report completed in this course enables students to work in groups and carry out an in-depth study of a problem, design, technological application or current issue related to the maritime sector. They will fully document and present their findings in a technical report and presentation.

**Technical Reporting Fundamentals**; **Research Topic Selection**; **Teamwork and Group Dynamics**; **Report Development**; **Presentation Development**

**Prerequisites** - CKMK 1201 (Technical Communications II); WKMT 2102 (Sea Phase II)

**Duration** - 13 weeks
**Lectures** - 4 hours/week = 52 hours total

**TKPR 312A/312B (Technological Thesis - Marine Engineering Technology)**
The technological thesis enables the student completing a Diplomatic Program to demonstrate the application of knowledge and skills developed throughout the program. Students taking this course will work independently on a project under the supervision of a faculty advisory committee. They will carry out an in-depth study of a problem, design or technological application, and fully document and present their findings.

This is a linked course – TKPR 312B must be completed in the academic term immediately following completion of TKPR 312A.

**Duration** - TKPR 312A - 13 weeks
**Lectures** - 3 hours per week
**Laboratories** - 2 hours per week

**TKPR 312B - TKPR 312A**

**Duration** - TKPR 312B - 13 weeks
**Lectures** - 1 hour per week
**Laboratories** - 3 hours per week

**TKPR 3500 (Electro-mechanical Fabrication Project)**
This course is designed for advanced level students to demonstrate the application of knowledge and skills developed throughout the program.

**Design Morphology**; **Project Selection**; **Problem Identification**; **Project Research and Planning**; **Project Proposal**; **Presentation for Equipment and/or Material**; **Project Performance**; **Project Analysis**; **Project Reporting and Presentation**

**Prerequisites** - BTech (OI)

**CMSC 1104 (Introduction to Technical Reporting)**; **ELTR 1104 (Electronic Fabrication Techniques)**; **WKPR 2201 (Fitting Shop)**; **CNTL 3105 (Instrumentation, Controls and Automation)**; **CNTL 3101 (Advanced Programmable Logic Controllers - PLCs)**; **ELTR 2214 (Microcomputer Interfacing)**; **ELTR 2107 (Electronic Troubleshooting)**
TKPR 411A - TKPR 415A

This course provides students the opportunity to design, implement, and report on a research project with potential benefits to the aquaculture industry. This is a linked course – TKPR 411B must be completed in the academic term that the project is conducted. This is both an introductory and practical course in the topic of refrigeration and air conditioning. It should draw on knowledge gained in Thermodynamics in the specific application of refrigeration.

TKPR 411B (Thermodynamics - Refrigeration/Air Conditioning)

This course is an introductory course in thermodynamics. The course will provide the student with the basics of thermodynamics and its application to various processes.

Prerequisites - PHYS 1101 (Physics); or PHYS 1100 (Physics); MATH 1100 (Pre-Calculus) or MATH 1102 (Pre-Calculus)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

TKPR 4120 (Thermodynamics)

This course follows from TKPR 2100 and applies the knowledge obtained in that course to specific mechanical systems. These applications are ones which the mechanical engineering technologist is likely to use in his or her future work.

Steam; Internal Combustion Engines; Combustion.

Prerequisite - TKPR 2100 (Thermodynamics)

Duration - 13 weeks
Lectures - 2 hours/week = 26 hours total
Laboratories - 1 hour/week = 13 hours total

TKPR 4130 (Applied Thermodynamics - Refrigeration/Air Conditioning)

This is both a theory and practical course in the topic of refrigeration and air conditioning. It should draw on knowledge gained in Thermodynamics in the specific application of refrigeration.

Refrigeration Cycles; Refrigeration Processes-Thermodynamics; Refrigerants-Properties; System Analysis; Component Analysis; Psychrometry; Air Conditioning Processes

Prerequisite - TKPR 4110 (Thermodynamics)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

TKPR 4140 (Applied Thermodynamics - Refrigeration/Air Conditioning)

This course is an intermediate level course following TKPR 2100 and 2200 with specific applications to systems in the marine industry.

Air Compressors; Steam Turbines; Gas Turbines; Heat Transfer; Heat Exchangers

Prerequisite - TKPR 4110 (Thermodynamics)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

TKPR 4150 (Thermodynamics)

This course follows from TKPR 2100 and applies the knowledge obtained in that course to specific mechanical systems. These applications are ones which the mechanical engineering technologist is likely to use in his or her future work.

Steam; Internal Combustion Engines; Combustion.

Prerequisite - TKPR 2100 (Thermodynamics)

Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 1 hour/week = 13 hours

TKPR 415A/415B (Technical Project - Sustainable Aquaculture)

This course provides students the opportunity to design, implement, and report on a research project with potential benefits to the aquaculture industry. This is a linked course – TKPR 411B must be completed in the academic term that the project is conducted. This is both an introductory and practical course in the topic of refrigeration and air conditioning. It should draw on knowledge gained in Thermodynamics in the specific application of refrigeration.

Refrigeration Cycles; Refrigeration Processes-Thermodynamics; Refrigerants-Properties; System Analysis; Component Analysis; Psychrometry; Air Conditioning Processes

Prerequisite - TKPR 4110 (Thermodynamics)

Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week

TKPR 0200 (Machine Shop)

This course is designed to add to, and further develop the skills acquired in WKPR 0101. The student will be given instruction and hands-on experience in the use of machine shop machinery and methods.

Lathe Components and Their Functions; Use, Care, and Maintenance of the Lathe; Use, Care, and Maintenance of Pedestal and Bench Grinders; HSS and Carbide Tool Bit Terminology and Geometry; HSS Tool Bit Grinding; and Sawing Machines

WKPR 0010 (Fitting Shop)

This is an introductory fitting shop course designed to introduce the student to fitting shop safety, terminology, and machinery and to provide hands-on experience with the hand and power tools used in a fitting shop.

Fitting Shop Safety; Layout and Layout Tools; Selection, Care, and the Use of Files; Selection, Care, and the Use of Hacksaws; Drills and Drill Presses; Selection and the Use of Taps; Selection and the Use of Dies; and Metrology

Duration - 13 weeks
Lectures - 1 hour/week = 13 hours total
Practical Exercises - 2 hours/week = 26 hours total

WKPR 0013 (Welding Shop)

This is an introductory welding course designed to introduce the student to welding shop safety, terminology, and tools and equipment and to provide hands-on experience with the welding tools and equipment used in a welding shop.

Safety; Oxy-Acetylene Equipment Orientation and Set-Up; Operating Oxy-Acetylene Cutting Equipment; Oxy-Acetylene Fusion Welding; Oxy-Acetylene Non-Fusion (Brazing); Shielded Metal Arc Welding; and Testing

Duration - 13 weeks
Shop - 4 hours/week

WKPR 0017 (Fitting Shop I)

This introductory course is designed to give the student hands-on experience with the practical aspects of welding and fitting.

Offshore Fabrication Work Environment; Safety Requirements; Structural Steel; Hand Measuring and Layout Tools; Procedures used to Fabricate using Various Structural Shapes; Hand and Power Cutting Tools; Drilling and Threading Tools; Grinding and Finishing; Bending and Rolling; Stationary Powered Shearing; Iron Worker Operation; Oxy-Fuel Cutting, Heating and Gouging; Fusion, Brazing and Braze Welding; SMAW II (Fillt Weld Flat and Horizontal); Metalurgy, Expansion and Contraction Control; Jigs and Fixture Fabrication

Co-requisite - STWK 0108 (Fabrication Theory I); STWK 0107 (Welding Theory I)
Duration - 13 weeks
Laboratories - 21 hours/week

WKPR 0100 (Technical Project - Sustainable Aquaculture)

This course provides students the opportunity to design, implement, and report on a research project related to various aspects associated with water and water use.

This is a linked course – TKPR 411A/B/C must be completed sequentially in the same academic year.

Identification of Potential Projects; Project Selection; Design and Analysis; Implementation; Reporting
**WKPR 0207 (Welding and Fitting Shop II)**

This intermediate course is designed to enhance the student's practical knowledge of offshore steel fabrication. The student will practice using these tools safely and properly on shop projects. Stationary Workshop Tools, Metal Fasteners, Piping, Alignment, Pressure Gauges

**Prerequisite** - WKPR 0100 (Machine Shop)

**Duration** - 13 weeks

**Lectures/Shop** - 4 hours/week

**Introduction to Machine Shop:** Lathe Components and their Functions; Use, Care, and Maintenance of the Lathe; Use, Care, and Maintenance of Bench and Pedestal Grinders; HSS and Carbide Tool Bit Terminology and Geometry; HSS Tool Grinding; Spindle Nose Tooling; Methods of Chucking; Metrology; Machining of 60 Degree External and Internal Unified Thread; Thread Terminology.

**Duration** - 13 weeks

**Laboratories** - 4 hours/week

**WKPR 1106 (Fitting Shop)**

This is a pre-employment skills training course designed to teach the student how to identify, select and safely use proper tools for given applications. The student will also learn the safe and proper use of tools.

**Laboratories** - 5 weeks

**WKPR 1107 (Welding Shop)**

This course is designed to provide students with theoretical and practical oxygen/acetylene gas cutting and electric arc welding.

**Laboratories** - 0 hours/week = 0 hours total

**Duration** - 13 weeks

**Lectures** - 1 hour/week

**Laboratory** - 7 hours/week

**WKPR 1109 (Welding Shop I)**

This is an introductory course designed to teach the student how to identify, select and safely use proper tools for given applications. The student will also learn the safe and proper use of tools.

**Laboratories** - 1 hour/week

**Laboratories** - 7 hours/week

**WKPR 1110 (Fitting Shop I)**

This is a skills training course designed to teach the student how to identify, select and safely use proper tools for given applications. The student will also learn the safe and proper use of tools.

**Laboratories** - 3 hours a week = 39 hours total

**Duration** - 13 weeks

**Lectures - 0 hours a week = 0 hours total**

**Laboratory - 4 hours a week = 52 hours total**

**WKPR 1200 (Fitting Shop II)**

This is a skills-training course designed to give the student practical knowledge and techniques to perform tasks in arc welding.

**Laboratories** - 0 hours/week = 0 hours total

**Laboratory** - 4 hours a week = 52 hours total

**Duration** - 13 weeks

**Lectures** - 1 hour/week

**Laboratory** - 7 hours/week

**WKPR 1306 (Computer Integrated Fabrication)**

This course is designed to develop the skills necessary for the student to produce three-dimensional Computer-Aided Design (CAD) part and assembly models. The course will also develop the necessary skills for fabricating the models using 3D printers, Computer Numerical Control (CNC) milling machines and CNC lathes via Computer-Aided Manufacturing (CAM) software.

**Laboratories** - 3 hours a week = 39 hours total

**Duration** - 6 weeks

**Laboratories** - three 2-hour labs per week = 36 hours total

**WKPR 2101 (Welding Shop)**

This course is designed to give the student fundamental theoretical knowledge and to develop practical skills in electric arc welding.

**Prerequisite** - WKPR 1107 (Welding Shop) or equivalent

**Duration** - 13 weeks

**Lectures** - 2 hours/week

**Laboratory** - 6 hours/week

**WKPR 2106 (Welding Shop)**

This course is designed to teach the student how to identify, select and safely use proper tools for given applications. The student will also learn the safe and proper use of tools.

**Laboratories** - 0 hours/week = 0 hours total

**Duration** - 13 weeks

**Lectures** - 1 hour/week

**Laboratory** - 7 hours/week

**WKPR 2113 (Welding II)**

This course is designed to provide students with theoretical and practical oxygen/acetylene gas cutting and electric arc welding. The student will learn the safe and proper use of tools.

**Special Tools:** Metal Fasteners; Rigging; Minor Overhaul and Repair

**Prerequisite** - WKPR 1106 (Fitting Shop or equivalent)

**Duration** - 5 weeks

**Lectures** - 1 hour/week

**Laboratory** - 7 hours/week

**Duration** - 13 weeks

**Lectures** - 2 hours/week

**Laboratory** - 6 hours/week

**WKPR 2113 (Welding II)**

This course is designed to provide students with theoretical and practical oxygen/acetylene gas cutting and electric arc welding. The student will learn the safe and proper use of tools.

**Special Tools:** Metal Fasteners; Rigging; Minor Overhaul and Repair

**Prerequisite** - WKPR 1106 (Fitting Shop or equivalent)

**Duration** - 5 weeks

**Lectures** - 1 hour/week

**Laboratory** - 7 hours/week

**Duration** - 13 weeks

**Lectures** - 2 hours/week

**Laboratory** - 6 hours/week

**WKPR 2113 (Welding II)**

This course is designed to provide students with theoretical and practical oxygen/acetylene gas cutting and electric arc welding. The student will learn the safe and proper use of tools.

**Special Tools:** Metal Fasteners; Rigging; Minor Overhaul and Repair

**Prerequisite** - WKPR 1106 (Fitting Shop or equivalent)

**Duration** - 5 weeks

**Lectures** - 1 hour/week

**Laboratory** - 7 hours/week

**Duration** - 13 weeks

**Lectures** - 2 hours/week

**Laboratory** - 6 hours/week
Laboratories - 5 hours/week for 13 weeks = 65 hours total

Laboratory - 8 hours/week = 40 hours total

Laboratory - 1 hour/week

Laboratory

Laboratories - 13 weeks for 4 hours/week = 52 hours

Laboratory - 1 hour/week

Laboratory

Laboratories - 4 hours/week for 13 weeks = 52 hours

Laboratory - 13 weeks for 4 hours/week = 52 hours

Laboratory

Laboratories - 4 hours/week

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Laboratory - 1 hour/week

Laboratory - 4 hours/week

Laboratory - 5 weeks
Lectures - 6 hours (1 hour/week)
- 6 weeks

Work Term Procedures

- Professional work skills and techniques they will use during the work term. Participants will have opportunities to develop, learn, and adopt the high standards of professionalism expected of the ship’s officer.

WKTM 1102 (Sea Phase I - Nautical Science)
This is the first of two Sea Phases designed to ensure that the Officer Cadet gains the practical experience to become a competent ship’s officer. For most students, the first Sea Phase represents the beginning of their sea-going career and, as such, they will be expected to gain a full understanding of the vessel’s operations, safety awareness and discipline.

It should be understood that by the end of their second Sea Phase the Cadet must have accumulated at least twelve (12) months of sea time in order to meet the requirements of Transport Canada’s Marine Safety Directorate. Students are expected to observe, learn, develop and adopt the high standards of professionalism expected of the ship’s officer.

WKTM 1102 (Sea Phase I)
Prerequisites - Successful completion of all Technical Session 1 courses
Duration - Two months (subject to placement restrictions)

WKTM 1103 (Work Term I - Marine Engineering)
WKTM 1103 is designed to ensure that the student gains practical experience under Option 1 or Option 2. Under Option 1 students begin development of the competency requirements of a Ship’s Engineering Officer; under Option 2 students gain Marine Engineering Technologist practical experience. Each successfully completed work term is regarded as one course credit. To meet the requirements for graduation from the Marine Engineering Diploma Program, the student must successfully complete a total of three (3) work terms.

Prerequisite - A valid seafarer’s medical certificate is required for Option 1. In addition, the student must have successfully completed the following courses before acceptance in approved work terms:
- MREK 2107 (Marine Engineering Knowledge I); WKTM 1103 (Work Term I)

Duration - Option 1: Students must complete a minimum of 70 days of Transport Canada certified sea time and achieve the articulated evaluation in order to meet WKTM 2103 requirements. Option 2: Students complete a minimum 10-week work term in marine related, shore-based companies.

WKTM 2106 (Work Term - Marine Environmental)
The work term provides students with an opportunity to learn, develop, and practice high standards of professional behaviour and performance while in the work environment.

WKTM 2106 (Work Term - Marine Environmental Technology)
Prerequisites - WKTM 1002 (Work Term Preparation Seminar); MEEN 2100 (Marine Environmental), All Technical Session 1 Courses; All Term 4 courses
Duration - 8 weeks (Students are available from mid-May to the end of August)

WKTM 2107 (Work Term - Food Technology)
The work term provides students with an opportunity to learn, develop, and practice high standards of professional behaviour and performance while in the work environment.

WKTM 2107 (Work Term - Food Technology)
Prerequisites - Clear Standing (CL) or better in the academic semester immediately prior to the work term semester.

WKTM 2100 (Work Term Preparation Seminar) MATH 1101 (Introduction to Calculus); FOTE 2121 (Food Sanitation); BIOL 2102 (Microbiology) or BIOL 2105 (Microbiology)
Duration - 8 weeks
(Students are available from mid-May to the end of August)

Prerequisites - Clear standing (CL) or better in the academic semester immediately prior to the work term semester.

WKTM 2100 (Work Term Preparation Seminar) MATH 1101 (Introduction to Calculus); FOTE 2121 (Food Sanitation); BIOL 2102 (Microbiology) or BIOL 2105 (Microbiology)
Duration - 8 weeks
(Students are available from mid-May to the end of August)

Prerequisites - Clear standing (CL) or better in the academic semester immediately prior to the work term semester.

WKTM 2100 (Work Term Preparation Seminar) MATH 1101 (Introduction to Calculus); FOTE 2121 (Food Sanitation); BIOL 2102 (Microbiology) or BIOL 2105 (Microbiology)
Duration - 8 weeks
(Students are available from mid-May to the end of August)
COURSE DESCRIPTIONS

WKTM 3302 (Work Term - Bachelor of Technology - Ocean Mapping)
This work term is designed to ensure that the Ocean Mapping student gains the practical and technical experience to become competent in the field of Ocean Mapping. Students will be expected to gain a full understanding of the acquisition, analysis, dissemination and management processes associated with ocean data through the utilization of marine surveying equipment, remote sensing technologies, geographic information systems and oceanographic instrumentation. Students are expected to observe, learn, develop and adopt the high standards of professionalism expected of an Ocean Mapping Graduate to better prepare them for an exciting and rewarding career within this sector.

WKTM 3302 (Work Term - Bachelor of Technology - Ocean Mapping)
Prerequisites - Technical Session 3
Schedule - Students are required to work a minimum of 320 hours to constitute a work term

WKTM 3303 (Work Term - Bachelor of Technology - Ocean Instrumentation)
This work term is designed to ensure that the Ocean Instrumentation (01) student gains the practical experience to become a competent marine instrumentation technologist. Students will be expected to gain a full understanding of the duties of an instrumentation technologist, safety awareness and discipline. Students are expected to observe, learn, develop and adopt the high standards of professionalism expected of an instrumentation technologist.

WKTM 3303 (Work Term - Bachelor of Technology - Ocean Instrumentation)
Prerequisites - Technical Session 3
Schedule - Students are required to work a minimum of 320 hours to constitute a work term.

WKTM 4109 (Advanced Diploma - Integrated Coastal and Ocean Management)
The work term provides students with an opportunity to learn, develop, and practice high standards of professional behaviour and performance while in the work environment.

WKTM 4109 (Work Term - Integrated Coastal and Ocean Management)
Prerequisites - Terms One, Two and Technical Session - Advanced Diploma in Integrated Coastal and Ocean Management
Duration - 13 weeks

WKTM 4110 (Work Term - Water Quality)
The work term provides students with an opportunity to learn, develop, and practice high standards of professional behaviour and performance while in the work environment.

WKTM 4110 (Work Term - Water Quality)