This Prospectus sets forth the intentions of the Institute at the time of its publication with respect to all matters contained herein. The Institute is not 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 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, guide its activities, set 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.

This mission provides for the development of the Institute as an industry-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.

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.

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.

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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 Foxtrap, 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 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.

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.

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.

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 courses 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 collaboration with industry clients. In 2010, the School of Fisheries, under which CBED operates, 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 the marine and 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.

The Centre for Aquaculture and Seafood Development (C-ASD) has a solid history of building successful partnerships with other ocean sectors. In partnership with the Marine Institute’s Science 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 C-ASD’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 seafood 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 C-ASD offers industrial applied research, technology transfer and consulting services to its clients.

The Centre for Fisheries Ecosystems Research (CFER) was established in 2004 as a独立 research unit to pursue research on natural and artificial marine systems. 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 ecosystem. 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 supports 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:
- Bachelor 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 Naval Science
- Technical Certificate in Marine Diesel Mechanics
- Technical Certificate in Fire Rescue
- 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 Placement Office.

Industry response and development services of the School of Maritime Studies are offered through the Centre for Marine Simulations (CMS). The Centre for Marine Simulations (CMS) trains marine personnel to meet routine and emergency situations through simulator training and is 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 engineering room simulator, an electronic navigation simulator, a dynamic positioning simulator, a tug simulator and a global maritime distress safety 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) is charged with the responsibility of developing and delivering education and training and applied research and development programs in various aspects of technology as it is both used and needed 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 (CTec)

The Centre for Applied Ocean Technology (CTec), located at the Holyrood 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 2020 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 CTec are primarily focused in four key areas - ocean mapping, ocean observing systems, ocean instrumentation and underwater intervention.

Ocean Safety

The Offshore Safety and Survival Centre (OSSC) undertakes training and research to develop 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 Foutax, approximately 30 km from St. John’s and the Holyrood 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 (CNOSORB); Petroleum Industry Training Service; National Fire Protection Association (NFPA); International Fire Service Training Association (IFSTA) and St. John Ambulance.
The facilities of the OSSC are world class and include a survival tank equipped with an environmental simulation system; a helicopter underwater escape trainer (HUE); a large environmentally safe fire field outfitted with marine and offshore fire training simulators; a range of lifeboat/rescue capsules, fast rescue craft and sea going vessels.

The OSSC offers over 75 different courses to individuals and industry clients on a regular basis throughout the year. 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 all aspects of marine and industrial safety, and emergency response, in order to service the training needs of industries and individuals in Atlantic Canada.

DIVISION OF ACADEMIC AND STUDENT AFFAIRS
Academic and Student Affairs includes the Dr. C. R. Barrett Library, Student Affairs and teaching and learning services. The details of most of the services offered within the division are provided within the section of the calendar describing on-campus services.

The Dr. C. R. Barrett Library collection supports study and research in fisheries and aquaculture, marine technologies, nautical science, and the ocean environment. The collection also includes significant holdings in engineering.

The Office of the Registrar provides a variety of services to support the development of students at the Marine Institute, including program advising, admissions, and registration; grade handling and reporting; application of academic policies and regulations; maintenance of student records; and coordination of graduation and certification activities.

• Admissions Office works as a division of the Office of the Registrar to admit students to all Marine Institute administered programs. The admissions office acts as the institute liaison with Memorial’s School of Graduate Studies and the provincial Department of Advanced Education and Skills.

Student Affairs provides a variety of services for both current and prospective students. The department includes student recruitment, placement, recreation and fitness, as well as a variety of student support services.

• The Office of Student Recruitment provides the link between the Marine Institute and prospective students, the office connects with key partners at the secondary, post-secondary and industry levels to ensure that a wide range of prospective students are knowledgeable about available programs. As well, the office coordinates the campus tour program and is actively involved in the transition of a prospective student to an applicant.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 6, 2015, Thursday</td>
<td>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 8, 2015. 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.</td>
</tr>
<tr>
<td>September 7, 2015, Monday</td>
<td>Orientation Activities - First year Joint Diploma/Degree, Technology and Technician Diploma students.</td>
</tr>
<tr>
<td>September 9, 2015, Wednesday</td>
<td>Registration Deadline - Fall Term for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate students. Late registration fees will apply after this date.</td>
</tr>
<tr>
<td>September 11, 2015, Friday</td>
<td>Last day to apply for Supplementary Exams for Technical Session &amp; Summer Semester courses and Challenge Exams for Fall Semester.</td>
</tr>
<tr>
<td>September 14, 2015, Monday</td>
<td>Safety training begins - Bridge Watch Technical Certificate.</td>
</tr>
<tr>
<td>September 17, 2015, Thursday</td>
<td>Start date - Supplementary and Deferred Exams for Technical Session and Summer Semester courses and Challenge Exams for Fall Semester.</td>
</tr>
<tr>
<td>September 18, 2015, Friday</td>
<td>Start date - bridge training for Advanced Standing Mechanical stream students in Term three (3), ROV/UV program.</td>
</tr>
</tbody>
</table>
DIARY FOR ACADEMIC YEAR 2015-2016

WINTER SEMESTER 2016

January 1, 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
Late Registration fees will apply after this date

January 4, 2016, Monday
Classes start - Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificates - Bridge Watch and Marine Diesel Mechanics programs
Start date - Work Term two (2), Marine Engineering
Fees Payment Deadline - Winter Term

January 6, 2016, Wednesday
Last day to apply for Supplementary Exams for Fall Semester courses and Challenge Exams for Winter Semester

January 11, 2016, Monday
Supplementary, Deferred and Challenge Exams start

January 12, 2016, Tuesday
Supplementary, Deferred and Challenge Exams end

January 18, 2016, Monday
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
Last date to opt out of health and/or dental insurance in the Winter Semester
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
No student union fees will be refunded after this date
Last day to apply for Scholarships for Winter Semester

January 25, 2016, Monday
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 for Winter Semester

January 29, 2016, Friday
Classes end - Bridge Watch Technical Certificate

February 1, 2016, Monday
Last date to apply for Examination Re-reads of Fall 2015 exams
Last date to apply for Credit Transfer for Winter Semester
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
(No refunds will be granted to students in Winter Semester Programs after this date.)
Safety Training begins - Bridge Watch Technical Certificate

February 15, 2016, Monday
Last date - Students in Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate Marine Diesel Mechanics programs, to drop courses without academic prejudice

February 26, 2016, Friday
Safety Training ends - Bridge Watch Technical Certificate

February 29, 2016, Monday
Work Term begins - Bridge Watch Technical Certificate

March 11, 2016, Friday
Last day to apply for Graduation in June, 2016

March 14, 2016, Monday
No Classes - Mid-March Holiday (St. Patrick’s Day)

March 15, 2016,
Tuesday Classes follow Monday’s schedule

March 25, 2016, Friday
No Classes - Good Friday

DIARY FOR ACADEMIC YEAR 2015-2016

March 28, 2016, Monday
No Classes - Easter Holiday

March 30, 2016, Wednesday

April 6, 2016, Wednesday
Classes end - Winter Semester for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate programs

April 11, 2016, Monday
Exams begin - Winter term for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate programs

April 15, 2016, Friday
Exams end - Winter term for Joint Diploma/Degree, Diploma, Advanced Diploma, Post-Graduate Certificate and Technical Certificate programs
Registration deadline - Technical Session, Summer Semester and Safety Training for Joint Diploma/Degree, Diploma, Advanced Diploma and Technical Certificate Marine Diesel Mechanics programs
Registration deadline - Work Terms for Diplomas, Advanced Diplomas and Technical Certificate programs
Late Registration fees apply after this deadline
End date - Work Term two (2) - Marine Engineering
Last date to add courses for Technical Sessions

TECHNICAL SESSION AND SUMMER SEMESTER 2016

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 18, 2016, Monday
Start date - Technical Session one (1) and three (3) Nautical Science
Start date - Safety Training for Marine Diesel Mechanics
Start date - FDTE 2118 (Canned Foods and Thermal Processing) - Advanced Diploma in Food Safety and Joint Diploma/Degree (Food Technology)
Start date - SFTY 1125 (SVOP), SFTY 2102 (MED A3), SFTY 1101 (Standard First Aid) and Boat Handling - Advanced Diploma in Sustainable Aquaculture program

April 22, 2016, Friday
End date - FDTE 2118 (Canned Foods and Thermal Processing) - Advanced Diploma in Food Safety and Joint Diploma/Degree (Food Technology)

April 25, 2016, Monday
Start date - Work Term two (2) for Marine Environmental
Start date - Work Term one (1) - Joint Diploma/Degree Food Technology
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 and Integrated Coastal and Ocean Management
Start date - Summer Term - Marine Engineering, Term six (6):
Start date - Safety Training for Advanced Marine Engineering Term seven (7)
Start date - FDTE 3102, FDTE 3104, FDTE 3108 - Advanced Diploma in Food Safety and Joint Diploma/ Degree (Food Technology)

April 27, 2016, Wednesday
Last date to apply for Supplementary and Deferred Exams for Winter Semester courses and Challenge Exams for Technical Session

May 5, 2016, Thursday
Supplementary, Deferred and Challenge Examinations begin

May 6, 2016, Friday
End date - SFTY 1125 (SVOP), SFTY 2102 (Med A3), SFTY 1101 (Standard First Aid) and Boat Handling - Advanced Diploma in Sustainable Aquaculture
DIARY FOR ACADEMIC YEAR 2015-2016

May 6, 2016, Friday  End of Winter Semester - Advanced Diploma in Sustainable Aquaculture and Advanced Diploma in Food Safety
End date - FDE 3102, FDE 3104, FDE 3108 - Joint Diploma/ Degree (Food Technology)
End of Technical Session 1 - Joint Diploma/ Degree (Food Technology)
End date - Work Term - Bridge Watch Technical Certificate

Supplementary, Deferred and Challenge Examinations end

May 9, 2016, Monday  Last date to add courses for Summer Term - Marine Engineering, Term six (6)
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 2016 Semester.
No student union fees will be refunded after this date

May 16, 2016, Monday  Start of Work Term - Advanced Diploma in Food Safety
Start Date - Work Term two (2) - Joint Diploma/Degree (Food Technology); Advanced Diploma in Sustainable Aquaculture

Last date - students in Marine Engineering Term six (6) to drop courses and receive a 50% refund of tuition fees the Summer 2016 Semester

May 23, 2016, Monday  No Classes - Commonwealth Day

May 24, 2016, Tuesday  Last date to apply for Credit Transfer for Technical Session and Summer Semester
Last date to apply for Examination Re-reads of Winter 2016 exams
Last day - students in Marine Engineering Term six (6) to drop courses and receive a 25% refund of tuition fees for the Summer 2016 Semester.
(No refunds will be granted to students in Summer Semester Programs after this date)

May 25, 2016, Wednesday  End date - Technical Session two (2) - Marine Environmental Technology

May 26, 2016, Thursday  Classes follow Monday’s schedule

May 27, 2016, Friday  End date - Technical Sessions one (1), two (2) and three (3) - Naval Architecture
End date - Technical Sessions one (1), two (2) and three (3) - Marine Engineering Systems Design
End date - Technical Sessions two (2) and three (3) - Ocean Mapping
End date - Safety Training for Advanced Marine Engineering Term seven (7)

June 3, 2016, Friday  End date - Technical Session one (1) - Ocean Mapping
End date - Technical Sessions one (1) and two (2) - ROV/UV programs
End date - Technical Session Advanced Diploma in Water Quality and Advanced Diploma in Integrated Coastal and Ocean Management
End date - Work Term two (2) - Marine Environmental Technology
Safety Training Ends - Marine Diesel Mechanics

June 6, 2016, Monday  Start date - Work Term - Ocean Mapping program

June 7, 2016, Tuesday  Last date - students in Marine Engineering Term six (6) to drop courses without academic prejudice

June 10, 2016, Friday  End date - Technical Session three (3) - Nautical Science
Start date - Work Term - Technical Certificate Marine Diesel Mechanics

June 13, 2016, Monday  End date - Technical Session one (1) - Marine Environmental Technology
Start date - Work Term - ROV/UV
Start date - Work Term - Advanced Diploma in Water Quality, Advanced Diploma in Integrated Coastal and Ocean Management and Marine Environmental (Work Term 1)

June 17, 2016, Friday  End date - Technical Session one (1) and two (2) - Nautical Science
End date - Technical Session two (2) - Marine Engineering Knowledge

June 17, 2016, Friday  Graduation

June 20, 2016, Monday  No Classes - Discovery Day

June 21, 2016, Tuesday  Start date - Sea Phase one (1) and two (2) - Nautical Science
Start date - Work Term one (1) - Marine Engineering Technology

June 24, 2016, Friday  End date - Technical Session one (1) and two (2) Marine Engineering Technology
Classes follow Monday’s schedule

July 1, 2016, Friday  No Classes - Memorial Day/Canada Day Holiday

July 11, 2016, Monday  No Classes - Mid-July Holiday (tentative)

July 12, 2016, Tuesday  Classes follow Friday’s schedule

July 29, 2016, Friday  Classes end Summer Semester Marine Engineering Term six (6),

August 1, 2016, Monday  Exams Begin - Marine Engineering Term six (6)

August 3, 2016, Wednesday  No Classes - Regatta (Civic) Day

August 5, 2016, Friday  Exams End - Marine Engineering Term six (6)

August 8, 2016, Monday  Safety Training begins - Marine Engineering Term six (6)

August 26, 2016, Friday  End date - Nautical Science Sea Phase one (1), Nautical Science Sea Phase two (2);
End date Marine Engineering Work Term one (1);
End date - Marine Environmental Work Term one (1);
End date - Work Terms for Advanced Diplomas in Food Technology Work Terms one (1) and two (2);
End date - Work Terms for Advanced Diplomas in Food Safety and Sustainable Aquaculture
End date - Work Terms for ROV/UV and Ocean Mapping programs
End date - Safety Training ends - Marine Engineering Term six (6)
End date - Work Term for Marine Diesel Mechanics

September 23, 2016, Friday  End date - Advanced Diploma in Water Quality and Advanced Diploma in Integrated Coastal and Ocean Management Work Terms

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.
ACADEMIC COUNCIL 2015 - 2016 cont........

SCHOOL OF MARITIME STUDIES

ACADEMIC COUNCIL 2015 - 2016 cont........

CMS

SERT Centre

MARINE INSTITUTE GOVERNANCE

MARINE INSTITUTE GOVERNANCE


SCHOOL OF OCEAN TECHNOLOGY


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Matchem, J., B.Eng., B.Ed. (Post Secondary) *Memorial*
Matchim, R., B.Eng. *Memorial*
Roche, R., B.Eng. *Memorial*
Roy, A., CEGEP Diploma (Surveying), *Limoilou College*, MSc. *Memorial*
Smith, W., Red Seal Industrial Electrical and Instrumentation Controls, Diploma Electronics Technology (CET) *College of Fisheries, B.Tech.*, MSTM, B.Ed. (Post-Secondary) *Memorial*
St. Hilaire, D., B.Sc. Laval University, Ph.D *Memorial*
VanderVoort, R., B.Sc. (Applied Physics) *University of Windsor*
Venkatraman, S., B.Eng. *Bharathidasan University, India*, M.Eng. *SASTRA University, India, B.Ed Memorial*
White, C., B. Eng. *QUT Australia*, MSc., (Eng) *Cranfied University United Kingdom*, MSc. (Information Systems), *UNSW, CPEng Australia*
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.

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 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 in Marine Studies (Fisheries Resource 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
Office of the Registrar
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:

Copies submitted by applicants will not be considered official documents.

The application deadline for Fall term admission is April 15th for Canadian applicants and April 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

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 April 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.

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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

Note:

Transcripts submitted directly by applicants to the Office of the Registrar will not be accepted.
ADMISSION TO THE MARINE INSTITUTE

2. Admission Requirements

The regulations governing admission to Marine Institute programs are provided below. Applicants are advised to review 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 seeking entry to Marine Institute programs which lead to Transport Canada Certification for Seafarers should note that Transport Canada requires proof of satisfactory physical fitness prior to sitting for 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 enrolment. This proof is required for participation in simulated emergency situations and is also required for Transport Canada certification.

The three medicals involved are known as the Marine Institute Medical (MI Medical), Transport Canada (TC) Medical, and the Canadian Association of Petroleum Producers (CAPP) Offshore Medical. Students enrolled in programs which lead to seagoing careers must submit the appropriate medicals.

Offshore Medical. Students enrolled in programs which lead to seagoing careers must submit the appropriate medicals.

To obtain a list of physicians designated to perform the Seafarers’ Medical in your area please visit the Transport Canada website at: http://www.tbs-sc.gc.ca/saf-sec/ur41/mme-mmd/.

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: http://www.capp.ca/publications-and-statistics/publications/233929

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) and 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
- Remote 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, may be eligible for 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 (Fisheries Resource Management), 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/regoff/calendar.

2.7 Post Graduate Certificate Programs

Candidates 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 post-secondary 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). Applicants are also required to provide a resume, an academic reference letter and a letter of interest.

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 must possess a combination of formal education and work experience acceptable to the Admissions Committee.

2.8.2 Integrated Coastal and Ocean Management

Candidates for admission to the Advanced Diploma in Integrated Coastal and Ocean Management must be graduates of an appropriate diploma of technology (three (3) years duration), or a degree, or must have sufficient relevant work experience as determined by the Admissions Committee, in a discipline related to research, development and/or administration of the coastal zone.

2.8.3 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.

2.8.4 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 introductory courses in biology and chemistry.

NOTE: The Marine Institute reserves the right to refuse admission to any applicant.

ADMISSION TO THE MARINE INSTITUTE

2. Program Requirements

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)

2.2.2 Diploma Programs:

- Marine Engineering (TC Medical)
- Marine Environmental (TC Medical)
- Nautical Science (TC Medical)
- Remote Operated Vehicles (ROV) Operator (CAPP Medical)

2.2.3 Technical Certificate Programs:

- Bridge Watch Program (TC Medical)
- Fire Rescue (MI Medical)
- Harvesting (TC medical)
- Marine Diesel Mechanics (TC Medical)
- Marine Engineering (TC Medical)

Proof of physical fitness must be provided by way of a signed medical from an approved physician. Only physicians who are authorized by the Marine Institute and Transport Canada may perform the relevant medicals. Details of the physical requirements for the TC marine medical certificate may be obtained from the Marine Institute Library or 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) 712-5167

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


To obtain a 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:

ADMISSION TO THE MARINE INSTITUTE

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 desiring admission 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 Graduate Level

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 3101A, 3101B, 3102 or Physics 3204 or Earth Systems 3209. The remaining two (2) credits may be from 2000 level courses in the above subject areas or from Science 1209.

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 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, or Physics 3102A, 3102B, 3102C 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 (the Secondary IV Certificate for Quebec applicants) with a passing mark in the required courses and an overall average of no less than 60% in these courses.

2.9.6 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 must 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 Eight (8). 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). In addition, candidates must possess a valid Driver’s Licence with an Air Brake Endorsement.

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**

Applicants 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 TP2263 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 Seafarer’s - Physician’s Guide) for the related standards. Proof of physical fitness is also required for students to participate in Marine Emergency Duties (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.

2.13.2 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 counsellor, 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 for 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 or transfer 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 transfers 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 of Newfoundland. Therefore, applicants seeking admission must possess an adequate knowledge of written and spoken English to pursue their studies. Regardless of the country of origin or citizenship status, applicants will be required to provide proof of 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 as 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 regarding TOEFL programs is available from the Educational Testing Service, Box 899, Princeton, New Jersey, U.S.A., 08540, from U.S. Embassies and consulates, or from offices of the U.S. Information Services.

- Michigan English Language Assessment Battery (MELAB)
  A minimum score of 50 is required on the paper-based test of the MELAB. 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 55 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 Michigan English Language Assessment Battery may be obtained from the Testing and Certificate Division, University of Michigan, 2001 North University Building, Ann Arbor, Michigan, U.S.A., 48109-1057.

- International English Language Testing System (IELTS)
  A minimum overall Band Score of 6.5, and a band score of at least 6 on both the Writing Band and the Reading Band are 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 6.5 on the Overall Band Score and/or a band score of less than 6 on either the Writing 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 skills tested (Reading, Writing, Listening, Speaking), with at least two band scores of at least 5.0 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
  On-line: www.cael.ca Email: cael@cael.ca

- Canadian Test of English for Scholars and Trainees (CanTEST)
  Minimum band scores of 4.5 in the listening comprehension and reading comprehension sub-tests and a score of 4.5 in writing are required to satisfy Marine Institute English proficiency requirements. The official results of the CanTEST must be forwarded directly to the Marine Institute from the CanTEST Testing Centre. Applicants submitting a CanTEST test assessment with band scores of less than 4.5 in the listening comprehension and reading comprehension sub-tests and a score of less than 4.5 in writing, 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 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 6N5

In extenuating circumstances and with the approval of the Admissions Committee, applicants may be permitted to provide proof of proficiency in English based on a proficiency test designed and administered by the Department of English at Memorial University.

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 in which no applicant has been formally accepted and the review of the applicant for admission is currently underway or about to begin. Following this review, additional information may be requested from the applicant or the applicant may be classified as Accepted, Conditionally Accepted, Not Accepted or Wait Listed.

2.18.2 Complete:

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

2.18.3 Decision:

This classification indicates that a decision has been made on an 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: Acceptance in their first year and high school (Level III) in Newfoundland, or individuals attending other post-secondary or secondary institutions may be Conditionally Accepted. To be placed in this category, an applicant must prior to the official release of their final grades and academic standing.

This conditional acceptance remains valid until the Provincial Department of Education releases the final results for high school students or an official transcript of results is provided by the post-secondary or secondary institution in question. A final determination of each applicant’s admission status will be made upon receipt of the official grades and standings. Conditionally Accepted applicants who meet all of the entrance requirements will be granted formal acceptance to the Marine Institute prior to the official release of their grades.

- Not Accepted: An applicant will be granted formal acceptance for 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.

Applicants who fail to meet the program entrance requirements will be 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 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 incomplete. 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 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, are especially those concerned with re-admission, supplementary examinations, 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. ACADEMIC POLICIES AND REGULATIONS

3.1 Academic Misconduct

The Marine Institute values academic honesty highly and does not tolerate acts of 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 acts as tampering with examinations, gaining unauthorized access to examinations, removing materials from the examination room, violating examination regulations or any other acts not described above which are considered to be acts of misconduct.

3.2 Academic Integrity

The Fisheries and Marine Institute of Memorial University is committed to the highest standards of academic integrity. Students are expected to:

- Complete and submit their own work for all assignments, tests, projects, reports, laboratories and examinations.

- Report all observed acts of academic misconduct to the appropriate authority.

- Use and distribute only material that is properly cited in the assignment, test, project, report, examination or presentation.

3.3 Retests

The Fisheries and Marine Institute of Memorial University is committed to individual student needs and is flexible in its retest policies. Students who fail to meet the program entrance requirements will be offered a retest. The results of the retest will be released to the student and the Marine Institute.

3.4 Academic Change of Status

An applicant for admission to the Marine Institute may change their admission status to: Conditionally Accepted, Not Accepted or Wait Listed.

- Conditionally Accepted: An applicant will be conditionally accepted when all entrance requirements are met and a position is reserved in the program for the applicant.

- Not Accepted: An applicant will be not accepted when all entrance requirements are met and a position is reserved in the program for the applicant.

- Wait Listed: An applicant is placed on 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.
The following guidelines are a subset of the Regulations above policy. The registration of each student in a course implies that he or she, offices of each School Head or the Registrar.

In Institute or external agencies such as Transport Canada.

continuation in a program or for certification by the Marine Institute.

Attendance is included as part of the student's academic record. It is the Marine Institute's policy that attendance in all classes, labs, and all other scheduled meetings is compulsory for students.

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. It is the Marine Institute’s policy that attendance in all classes, labs, and all other scheduled meetings is compulsory for students.

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 some short 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 read 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 inexorably 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 designee, the student’s attendance does not improve, he or she may be discontinued from that course. In such cases, if this occurs following a course drop or fees refund deadlines, 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 determining factors 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 understands this responsibility and agrees 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 accessing 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 a computer system and should remain confidential. Any suspected leak of a password OR other loopholes in system security should be reported immediately to the Computer Services 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 not 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 deprive other users 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 possibility of infection by computer viruses. Computer Systems are not to be used for games or other non-academic recreational activities (e.g. MDP’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, the fall semester begins in September, the winter semester 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 carries 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 registration in the course for which it is required. A co-requisite course is a course which may be taken concurrently with a computer system and should be required.

Program refers to an academic program forming a coherent unit of study including a series of courses, the completion of which, if other requirements are met, qualifies the candidate to receive the appropriate award.

Award refers to the type of certificate or diploma to be conferred upon candidates completing a Marine Institute Program and is approved by the Marine Institute Academic Council to receive this award. Awards are issued 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. Marine Institute Advanced Diplomas, Technology Diplomas, Technician Diplomas and Computer Systems are conferred 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 technical area to graduates of at least first degree or three-year technology diploma program. These are normally one academic year in length, except that work terms or job placement requirements may extend programs beyond this time. Provision 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 affords the student a record of academic accomplishment in a given discipline.

Joint Diploma programs are designed to prepare graduates for employment as technologists. These programs are normally three academic years in length. However, some programs extend beyond this time as a result of work term or job experience requirements.

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, or 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. PARTNERSHIPS/Sponsored 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 in partnership with another educational institution, a joint certificate formally recognizing both institutions may be awarded. This certificate 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 for Credit form can be obtained upon request from the Office of the Registrar or the information centre and must be supported by the following documents:

• Official transcript(s) from any university and college attended (if not already provided during the application process).

Specifically, applicants must ensure their request is supported by an official transcript of their marks for the course in question.

• Official Calendar Descriptions or Course Outlines from the other institution(s), where the work in question was previously completed, of the courses claimed for credit.

As an application is not considered complete until these documents have been received, applicants are advised:

• to submit their Application for Admission with their Application for Credit as early as possible, and that it is the student’s responsibility to provide the pertinent documents to allow sufficient time to evaluate the application for credit and to assess admission status.

Where possible, applicants will be advised by the Office of the Registrar of the results of transfer credit evaluations in advance of registration. Where approval has not been received in advance of Registration, students should register for the course in question pending the outcome of their application.
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/or the School Head, work completed for advanced/graduate credit 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 Marine Institute as part of one Advanced Diploma or Post-Graduate Certificate program, who is subsequently admitted to another Advanced Diploma or Post-Graduate Certificate program, may apply to 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.
- 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 Marine Institute, apply to 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).
- Transfer credit will not be awarded for course work completed on a pass/fail basis.
- Transferred work will not be counted in the term's cumulative average or in the cumulative average in the Advanced Diploma or Post-Graduate Certificate Program.
- Permission to take courses at other universities for credit in Advanced Diploma or Post-Graduate Certificate Programs must be approved in advance by the School Head.

6.3 Evaluation of Credit Applications

Credit for courses completed at this or any other institution will be considered by the Marine Institute under the following conditions:

- Students apply to the Registrar on the Application for Transfer of Course Credit Form.
- Applications are received within four weeks of the course registration dates.
- The application includes all of the pertinent documentation as outlined above.
- Further information regarding courses previously completed, as required by the Marine Institute in order to fully evaluate an application for credit, is provided by the student. The information requested may be obtained by the student from the other institution or may be submitted directly to the Marine Institute by the other institution, upon request by the Marine Institute to the applicant. Such information may include: Official course outlines or syllabi and information about the number of hours of instruction.
- Only those courses 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 from the Office of the Registrar, or on-line at www.aes.gov.nl/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 work experience 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 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, he/she will be required to confirm his/her 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 Cashier, 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, and registered in, a program leading to a Certificate or Diploma.
- 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 requirements of the program.
- 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 PAS or FAL. 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 student may not withdraw the challenge once he/she has officially requested a Challenge Examination. Failure to complete the exam as approved will constitute failure of the exam. Students may not withdraw the challenge once he/she has officially requested a Challenge Examination. Failure to complete the exam as approved will constitute failure of the exam.
- 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, whether it is to be held 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 cases, a student is permitted to register late, the student must pay a late registration fee. No student may register following the last day 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/adm/hwtwksbvs/PWWWLogin. 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, 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 Technological Programs at the Fall Semester in their first semester at the Marine 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 TEA for programs for courses which are less than 21 days duration or longer. For Technical Session courses which are less than 21 days in duration, the following table applies:

<table>
<thead>
<tr>
<th>Length of Course</th>
<th>Deadline for DROPPING Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to Five Days</td>
<td>Six to Ten Days</td>
</tr>
<tr>
<td>Six to Ten Days</td>
<td>Eleven to Fifteen Days</td>
</tr>
<tr>
<td>Eleven to Twenty Days</td>
<td>Sixteen to Twenty Days</td>
</tr>
</tbody>
</table>
10. CLASSIFICATION OF STUDENTS

10.1 Full-Time Students

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 for that Semester.

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 is one or 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 Students

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 session.

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, requirements 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 is 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. Student 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. READMISSION AND CONTINUANCE

Subject to the readmission 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 at least 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 60% 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 60% will be awarded a Clear Standing (GO) and will be readmitted to the following semester without conditions.

A student who was admitted to the semester with a Clear Standing (GO) or better but who earns a cumulative average of between 50% and 59.9% at the end of a semester, and has passed 50% of the courses for which a 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 readmitted 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 readmitted to the next semester with an Academic Warning (AW).

A student who has been required 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 readmitted to the Marine Institute only in exceptional circumstances and only upon approval of an Admissions Committee.

A student who has been required 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 readmitted 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. Students who have interrupted their program may be required to complete additional courses so that they may meet program requirements under the new regulations.

12.2 Withdrawal From the Marine Institute

A student who wishes to voluntarily withdraw from the Marine Institute and officially drop all courses for which he/she is currently registered must do so on-line by dropping all courses through Student selfservices. Refund policies will be applied.

Students registered for two or more courses in a Technical Session for a diploma student is four or more courses. 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.

13. REPORTING PERFORMANCE

13.1 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 lists 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 term 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 Numeric Grade followed by the letter “I” indicates that even though the grade received is above 50%, the required passing grade for that course is higher than the actual grade received.

• PAS indicates that the student’s performance meets expectations but no numeric grade is recorded.

• DR indicates that the student dropped the course without academic prejudice. No grade is provided.

• DFR indicates that the student dropped the course but has incurred academic prejudice. A grade of 0% is recorded.

• INC or IP indicates that the course is not yet complete. The grade will not be recorded until the course is completed.

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 readmitted 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 readmitted to the next semester with an Academic Warning (AW).

13.2 Aegrotat (AEG)

Aegrotat status is awarded to a student’s eligibility to continue in his/her program without completion of all semester work for the course in question, with advancement to subsequent courses (where waived). Aegrotat standing confers credit for the course(s) under consideration.

However, no grade is assigned and Aegrotat (AEG) is entered on the student’s permanent record.

Aegrotat will be awarded to a student who has:

• encountered exceptional circumstances such as illness which prevented completion of the semester’s work;

• demonstrated the ability to do the work; and,

• received the recommendation of the School Head.

13.3 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 assignments, examinations or any other form of evaluation offered for the course involved. Such permission will be contingent 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.

Once a student has registered to audit, he/she may not change their status to earn credit. Nor will a student who has registered for credit in a course be permitted to change his/her status to Audit.

The student may, in succeeding semesters, take any course for which credit that was previously audited. Auditing students must present a signed Permission to Audit Form to the Office of the Registrar. Permission to audit a course will not be granted until the number of students registered for credit in the class is known.

13.4 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 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.

13.5 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.

13.6 Part Time

A student is considered part time who is taking three or fewer courses in a semester.
13.7 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:

13.7.1 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)

13.7.2 Academic Warning (AW)

This standing applies to 1st 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%.

13.7.3 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 on condition. In this case the student is required to withdraw with the exception of technical session and workterms

13.7.4 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 is registered in a semester is 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.

13.7.5 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.

14. 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.

15. 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 exams in the same 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.

16. 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 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.

17. SUPPLEMENTARY EXAMINATIONS REGULATIONS

Marine Institute Supplementary Examination Regulations apply to students in Advanced Diploma, Diploma of Technology, Technician Diploma, and Technical Certificate programs.

• The privilege of writing supplementary examinations is limited to students who:
  (a) have failed no more than two subjects;
  (b) have obtained at least 70% of the specified passing grade in each subject failed;
  (c) have obtained a term or session average of at least 55%;
  (d) were 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 are permitted to write a maximum of two supplementary examinations for each of their enrollment in a program. Once a student has written two supplementary examinations, 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 examination 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 revised final grade, the grade obtained 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.

18. 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 completing their 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:

• have 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.

19. APPEALS POLICY AND PROCEDURES

The Appeals Committee of the Marine Institute Academic Council provides an objective review of students’ cases. This Committee considers student appeals of the Institute Academic 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, such as:
    • faculty member
    • a counselor
    • a lawyer or other professional, such as a doctor, a counselor, a lawyer or a professor.

• 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. A copy should 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 back pain requiring bed rest for a week.) causes severe back pain

iii) the length of time over which the student’s ability was likely hampered by the medical condition (e.g. recurring and severe back pain in a two month period would likely have a more adverse effect on studies than a single episode of back pain requiring bed rest for a week.)

iv) the fitness of the student to resume studies (it is in the student’s best interest not to return to his/her studies prematurely.)

The Institute respects the privacy of all students and, therefore, the confidentiality of all material contained in medical notes.

• Students claiming bereavement as grounds for an appeal must provide proof of death and evidence of a close personal relationship between themselves and the deceased.

• The members of the Appeals Committee do require substantial information about the reasons for the appeal in order to make their decisions. However, the committee also recognizes the student’s rights to confidentiality. With this in mind, a student may discuss the reasons for his or her appeal with the Institute counselor, who, with the student’s permission and provided sufficient reasons exist, may then write a letter to the committee confirming that there were sufficient grounds for an appeal without disclosing the special personal and confidential details of the case.

• In cases where a student wishes to appeal a decision of the Appeals Committee of the Marine Institute Academic Council, the appeal shall be directed to the Executive Committee of Academic Council. The Executive Committee shall determine if there is any further evidence or grounds to amend the previous decisions of the Appeals Committee.

• In all cases, written appeals must be made no later than two weeks after the decision of the Appeals Committee is made known to the student. Failure to do so will result in the forfeiture of the right to appeal.

20. 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.

20.1 General Procedures

20.1.1 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.

20.1.2 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. In all cases other than those resolved in step one above, the faculty member, witness to the event or, in the case of final examinations, the Supervisor of Examinations, shall prepare and submit a written report to the 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 the 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.

20.2 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.

20.2.1 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.

20.2.2 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 materials such as essays, laboratory reports, term work reports, 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.

20.2.3 Theft of Academic Materials:

This refers to the use and/or distribution of material 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.

20.3 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:

<table>
<thead>
<tr>
<th>OFFENSE</th>
<th>PENALTY</th>
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<tbody>
<tr>
<td>Theft of academic materials.</td>
<td>Expulsion</td>
</tr>
<tr>
<td>Possession, use, and/or distribution of stolen academic material</td>
<td>Expulsion</td>
</tr>
<tr>
<td>Giving false information to gain entrance to the Institute</td>
<td>Expulsion</td>
</tr>
<tr>
<td>Impersonation</td>
<td>Expulsion</td>
</tr>
<tr>
<td>Any other case of academic misconduct relating to a test, assignment, lab semester period, or semester report, which constitutes 10% or more of the final course grade</td>
<td>Reduction of Grade</td>
</tr>
<tr>
<td>Any other case of academic misconduct relating to a final examination</td>
<td>Reduction of Grade, Probation and/or Suspension</td>
</tr>
<tr>
<td>Any other case of academic misconduct relating to two or more final examination</td>
<td>Reduction of Grade and Suspension</td>
</tr>
<tr>
<td>Any or all acts of academic misconduct may result in a student being placed on probation with the Marine Institute, a reprimand, or suspension from the course. Multiple offenses of Academic Misconduct may result in a more severe penalty being applied</td>
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20.3.1 Submitting False Information:

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

(b) 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.
20.4 Description of Penalties

20.4.1 Reprimand:
A reprimand shall take the form of a written warning from the School Head informing the student that his/her academic conduct has been unacceptable to the Institute.

20.4.2 Reduction of Grade:
A reduction of grade penalty shall be imposed as follows:

(a.) On materials such as tests, assignments, labs, and similar semester work accounting for less than 25% of total mark; the student shall be awarded 0% for the work under consideration.

(b.) For semester reports, term projects including drawings, technical reports and other academic work which constitutes 25% or more of the total mark for a course; the course mark shall be 0%.

(c.) For final examinations; the course mark shall be 0%.

20.4.3 Probation:
The period of probation shall be from the time of conviction to the end of two academic semesters beyond the semester in which the offense took place. In no instance will the period of probation exceed three academic semesters for any one offense. A student who commits a second offense while under probation may be suspended or expelled upon the recommendation of the Executive Committee of the Marine Institute Academic Council.

20.4.4 Suspension:
A suspension may apply to a course, program, or the Institute. The length of the suspension shall be determined by the Executive Committee of the Marine Institute Academic Council and shall be conveyed to the student in writing by the Chair of Academic Council.

In no case shall the length of the suspension for any single offense exceed three academic semesters.

20.4.5 Expulsion:
Expulsion shall mean that the student is required to withdraw from the Institute. Students who have been expelled shall not be permitted to re-enter the Institute.

The recommendation for expulsion shall be made to the Executive Director for his/her final decision. Prior to the Executive Director’s decision, the Registrar shall notify the student in writing of the recommendation for expulsion.

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.

20.5 Application of Penalties
A student who has been found guilty of academic misconduct shall be subject to a penalty or penalties in keeping with the seriousness of the offense. Conviction of certain offenses shall involve automatic penalties as outlined above.

The Registrar shall be responsible for the enforcement of penalties resulting from the above procedures. In some cases more than one penalty may be imposed for the same offense. Previous academic misconduct will be taken into account in determining the penalty or penalties.

In all cases where a student has been convicted of academic misconduct and there is a record on file with the Registrar, the student shall be disqualified for scholarships based upon work completed during the academic year in which the offense took place.

If a student receives a mark of 0% for any academic work as a result of academic misconduct, where this is on file with the Registrar, the student shall not be permitted to write a supplementary examination in the course concerned.

20.6 Right of Appeal
In accordance with Marine Institute policy and procedures regarding Student Appeals, a student has the right to appeal a decision concerning his or her involvement in an alleged case of academic misconduct.

In cases where the matter was initially resolved by an instructor, appeals shall be made to the student’s School Head. In such cases, the School Head shall initiate action as per step 2 above under “Resolution of Offences”.

20.7 Disposition of Documentation
Documents relating to allegations under these procedures shall be disposed of as follows:

20.7.1 Allegations Not Supported:
In cases where the allegation was not supported, no documentation shall be retained.

20.7.2 Allegations Supported and Resolved by Instructor:
In cases where a minor offence is resolved by an instructor, documentation regarding 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.

20.7.3 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 all cases but minor offenses, the Registrar shall be notified of the student’s name and the offense including the course title, the nature of the offense, and the penalty imposed. For minor offenses the Registrar may be notified. Correspondence between the School Head and the student shall be copied to the Registrar as well. Records regarding the offense shall be retained in the student’s file.

20.7.4 Allegations Resolved Through Appeal:
In cases where a student appeals the determination of their guilt or the application of a penalty regarding a case of academic misconduct, all documentation regarding the case shall be garnered from the School Head. In the case that an appeal results in the reversal of a previous decision, all previous documentation shall be destroyed by the School Head and the documentation of the case in question shall remain with the minutes and records regarding the appeal. In the case that an appeal results in a previous decision being upheld, all documentation obtained from the School Head shall be returned and a copy retained with the records regarding the appeal. The record of the offence, the appeal and the outcome of the appeal shall be retained in the student’s file.

20.7.5 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.

21. 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.

21.1 Status
While on work terms, students are considered to be full-time students. All Marine Institute academic policies and regulations governing full-time students apply to students completing work terms.

21.2 Fees
Students entering work terms in Diploma of Technology and Advanced Diploma programs are required to pay a fee equivalent to the fee for one course for that student in that program at the time of registration. Please refer to the section concerning Fees and Financial Information for further details.

21.3 Registration
Students are permitted to conditionally register for a work term during the last week of classes of the preceding academic semester. This registration is conditional upon the completion of the preceding academic semester in which the student is enrolled and confirmation of the completion of any required prerequisites. Students who are required to withdraw at the end of the preceding academic semester are not eligible for placement in the work term and the conditional registration will be cancelled.

21.4 Placement
21.4.1 Placement Services and Coordination
All placements for work terms are coordinated jointly through the appropriate school and the Placement Office which assists employers and students in the selection process. The Institute does not guarantee placement. However, every effort is made to obtain adequate numbers of positions for students embarking on work terms. Please refer to the Student Services section for further information concerning the Placement Office.

21.4.2 Students Required to Withdraw from Programs
If a student is required to withdraw from a program, the Institute will not place the student until the student has been reinstated in the program.

21.4.3 Self Placement
Students may secure their own placements provided they consult with the Placement Office. It is critical that all such placements are discussed with the Placement Officer and prior approval is obtained from 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 academic status and the eligibility of the work completed for recognition as meeting work term requirements.

Students in School of Fisheries 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.

21.5 Evaluation
All students on work terms are required to complete a project as specified by the respective School. Written report or oral “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 employer’s evaluation and 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 an Institute representative.
21.6  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 honour a placement, 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.

21.7  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.

21.8  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.

21.9  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.

21.10  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 networked 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

HARASSMENT/DISCRIMINATION

Members of the Institute community are expected to treat each other with respect. The Institute does not tolerate any activity which may be harassing or discriminatory or which promotes harassment or discrimination. Students who feel that they are the subject of such activity are urged to report the matter to Student Affairs. The Institute will endeavour to ensure that the matter is dealt with promptly under the university-wide policy. Students may also contact the university’s Sexual Harassment Advisor directly at 864-2015 or the Sexual Harassment Office at 864-8199.
HEALTH INSURANCE

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.

Canadian Students

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.

International Students

International students may be eligible for coverage through the provincial health care plan, MCP. Students should contact the International Student Advisor located in Corte Real, Room 1000A on the St. John's campus.

DR. C.R. BARRETT LIBRARY

The Dr. C.R. Barrett Library is 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/cgi/index.php provides access to all in-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. Locker rentals are available in the Bookstore.

OFFICE OF THE REGISTRAR

The Office of the Registrar provides a variety of services to support the development of students at the Marine Institute. The primary role of this office is to interpret, uphold and contribute to the development of the academic policies and regulations of the Marine Institute; to coordinate the admission and enrollment of students at the Institute; to provide information regarding Institute programs, policies and regulations and courses to applicants, students and others; and to receive, process, manage and report all student and academic records relating to Marine Institute programs and students.

This office provides the following services:

- The production and distribution of the Institute calendar and program information brochures.
- The application and interpretation of Marine Institute academic policies, regulations and procedures.
- The provision, receipt, review of, and response to, applications for admission for all Marine Institute programs.
- The receipt and coordination of applications for transfer of credit from other institutions to the Marine Institute.
- Registration for students in programs and courses.
- The receipt and coordination of Course Audit applications.
- The provision and updating of student identification cards.
- The receipt and processing of changes to student registration information including course changes and student withdrawals.

- The processing of changes for address of 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 facility:

- 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.

HOUSING

Memorial University’s Department of Housing, Food, & Conference Services offers both on-campus and off-campus housing solutions for students of Memorial University, students on the St. John’s campus and those studying at the Marine Institute.

On Campus

Institute students may reside in Memorial’s main campus located about three kilometers from the Institute. Students are able to avail of traditional residence hall dormitory style housing in Paton College or apartment style residences in Burton's Pond. Both residence facilities are serviced by the city's transportation system.

Visit us on line: http://www.mun.ca/hfcs/

Off Campus

Memorial University’s Off-Campus Housing Office can help students find off-campus housing in and around the St. John’s area. As a convenience to students, the Office also maintains a directory of rental properties. Please note that the properties listed in the directory are neither endorsed nor approved by Housing, Food, & Conference Services.

SPECIAL NEEDS STUDENTS

The Marine Institute does offer support services for students with special needs in accordance with Memorial University’s Policy Accommodations for Students with Disabilities. Students should discuss their needs with Student Affairs personnel prior to the start of a term so services can be in place when the term starts. Appropriate documentation is required in order to avail of support services.

STUDENT AFFAIRS

Student Affairs offers services for students and prospective students. Services offered include:

- Academic and personal support
- Career, student aid, and scholarship information
- Transition and engagement programming
- Advising and assisting Student Council and other student groups on campus.
- Consulting with outside agencies regarding Institute programs.
- Advising individuals who may be interested in attending the Institute.

STUDENT PLACEMENT

The main function of the Placement Office is coordinating student work term employment in various programs offered by the Marine Institute. As well, additional services are offered to students and graduates through the Placement Office which include:

- Job Posting - Individual jobs are posted on a bulletin board.
- Resume Referral Service - Resumes of qualified candidates are collected and forwarded to the employers.
- On Campus Recruitment - Office space and board rooms are available to employers who wish to conduct interviews with students on campus.
- Employment Programs - Information on student and employer subsidy programs is available.
- Employer Database - A database of companies employing Institute graduates/students is maintained.
- Employer Resource Files - An employer file containing company information, annual reports, and applications for employment is available.
- Resume File - An up-to-date file of student and graduate resumes are made available to employers.
- Job Search Techniques - Students are assisted with cover letters, interview techniques, and resume preparation.
- Program Promotion - Institute programs are promoted to employers and graduate and work term placements are sought.
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 saver cards, Student Work Abroad Program (SWAP), International Student Identity Cards (ISIC), and Travel Cuts. 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 Lounge.

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 Metrobus routes. Special buses 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 FINANCIAL INFORMATION

The 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. http://www.mun.ca/regoff/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 program. 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. http://www.mun.ca/regoff/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 Diploma 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.

Tuition fees for all other programs can be obtained from the Office of the Registrar. Students sponsored by Human Resources & Labour and 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 and advanced diploma (MSTM) 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 diploma programs 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 Provincial and Federal Canadian Federation of Students (CFS) Fee of $4.38 per term is compulsory. All fees are payable at registration.

Application Fees:

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 $57.94 per term or $28.97 per session.

Confirmation Fee:

A non-refundable, nontransferable 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 you place is reserved in the program and is applied towards your tuition.

Transportation Services:

The Marine Institute is located on the South Side of the St. John’s harbor, along what is known as Ridge Road. Students entering the Marine Institute will arrive by bus, which is the most efficient means of transportation between the main entrance of the Ridge Road Campus and the main entrance of the Marine Institute. The Marine Institute is located one block from the Marine Institute Student Union House, which is the main entrance to the Marine Institute. The Student Union House is also the main entrance to the Marine Institute Student Union House.

Students entering the Marine Institute are 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.

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The 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.
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. If a student 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 $100.48 per term. International students should contact the Office of Student Affairs and Services for further 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 http://greenshield.ca/sites/student/ en/Pages/home.aspx 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 in 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 covered for health insurance only if a student wishes to opt out of the health plan they must make the necessary arrangements. If the long term sea phase or work term begins before September 1st of any given year, it is the student’s responsibility to make arrangements to opt out of the plan at the beginning of September, if they wish to do so. Students must opt out within the first two weeks of the schedule start date of their work term for their program as published in the academic diary. If a student wishes to add on dental coverage they must fill out an opt in form during the first two weeks of lectures per academic term, which can be picked up at the MISU office.

In the case where a student has just completed a work term and is entering into a new academic semester and has opted out of the health care plan the previous semester, the student is also required to opt out of the dental plan for the new semester if they do not wish to have the dental coverage. The deadline for opting out of the plan is two weeks after the first day of lectures for that semester.

If a student is registered for courses at both the St. John’s Campus and 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 how to use these banking systems can be obtained from your local branch.

Tuition Voucher - Students receiving a tuition voucher must present the voucher to the Cashier’s Office and 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 Canadian 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 on the 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 or 1-888-657-0800 for automated information service

Facsimile: (709) 729-2298

Office: Coughlan College on the St. John’s Campus of Memorial University -
STUDENT FEES REFUND POLICY:

TUITION

Full Semester Programs:
- In the first 11 days of class: 100%
- Day 12 to Day 16 of classes: 50%
- Day 17 to Day 21 of classes: 25%
- Day 22 and beyond: 0%

Less than Full Semester Program:
- In the first 5 days of classes: 100%
- Day 6 to Day 8 of classes: 50%
- Day 9 to Day 11 of classes: 25%
- Day 12 and beyond: 0%

Technical Sessions that are between 16 and 20 days:
- In the first 4 Days of classes: 100%
- Day 5 to Day 6 of classes: 50%
- Day 7 to Day 8 of classes: 25%

SCHOLARSHIPS AND AWARDS

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 also must 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 equal 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.
- Certificates 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.
SCHOLARSHIPS AND AWARDS

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 was established by the human resources department at Memorial University. The scholarship will be awarded 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. Preference will be given to a candidate of any age who has demonstrated academic ability, high energy and compassion to others.

The Mr. Justice Fintan J. Aylward Scholarship
This scholarship, the yearly interest from an endowment established by the Honourable Mr. Justice Fintan J. Aylward, Q.C., (a former Chairman of the Board of Fisheries, Navigation, Marine Engineering and Electronics and of the Marine Institute) is awarded to a student entering the first year of a diploma program at the Institute who has demonstrated an interest in marine law or marine safety.

Dr. C. R. Barrett Scholarship
This scholarship, the yearly interest from a $5,000 trust fund 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 John N. Barrett Scholarship
This scholarship, the yearly interest from a $2,000 trust fund 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 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 second or third year of the Marine Engineering program or the M.C.T Engineering program who has demonstrated high academic ability and a strong sense of initiative and perseverance.

John Butt Memorial Scholarship
This scholarship given by the St. John's Philatelic Society in memory of John Butt is awarded to a student continuing his or her studies at the Institute.

The Ed Bowdring Memorial Scholarship
The scholarship was established by the friends and colleagues of Ed Bowdring as a memorial to an exceptional photographer who has left a valuable photo record of the people of the land and the sea. This scholarship, the interest from a trust fund, is awarded to a student who demonstrates a creative use of video or still photography as part of his or her studies, or develops an innovative media-related project for the benefit of rural Newfoundland and Labrador.

Heber Bowring Memorial Scholarship
This scholarship, the yearly interest from a $5,000 trust fund, will be awarded to a student in Engineering Technology.

Canadian Federation of University Women - St. John's Club Scholarships
These scholarships are awarded to women whose studies are leading to a career in a non-traditional working area for women.

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.

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.

Corey Eddy Memorial Scholarship
This scholarship is awarded annually to a student demonstrating a high level of academic ability and a strong sense of initiative and perseverance.

The Wayne Dalton Memorial Scholarship
This scholarship in memory of Wayne Dalton is awarded to a student in the second or third year of the Nautical 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, Q.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 Dopplinger Memorial Scholarship
This scholarship was established by the family of Frank Dopplinger, 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 fishery-related program based on academic performance.

Randy Emberley Memorial Scholarship
The Randy Emberley Memorial Scholarship, donated by his fiancée 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 resident, is awarded 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 focus on Geographic Information 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.

Fish, Food and Allied Workers Scholarships
These scholarships are awarded to first year Food Technology students based on entrance average.

Friends of India Association Scholarship
Awarded annually to a student with the highest average in the institute by the Friends of India Association.

Flight 491 Legacy Scholarships
This scholarship is awarded annually to a student who demonstrates a high level of academic ability and dedication to healthy living. The bursary is in honour of Randy Emberley, a recreation specialist at MI who had a long commitment 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 Electrical Engineering program at either the Marine Institute, Cabot College, College of the North Atlantic and who has maintained a minimum of 70% average throughout the diploma program.

The Kjell Henriksen Scholarships
Two scholarships donated by the widow of the late President of the Canadian Saltfish Corporation, in memory of her husband, awarded annually to second and third-year diploma students and advanced diploma students in the School of Fisheries who are the sons and daughters of native-born Newfoundlanders.

The Hibernia Management and Development Company Ltd. Scholarships
These scholarships shall be awarded annually to one male and one female student in either the second or third year of the Marine Environmental Engineering Technology program.

The Dale Hoesch Memorial Scholarship
This scholarship is awarded to a student in a diploma of technology program who has demonstrated exceptional commitment to helping other students. It is based on the recommendation of the selection committee.

The Fry Family Foundation Marine Institute Diploma of Technology Entrance Leadership Scholarship
These scholarships are awarded to Newfoundland and Labrador students entering diploma of technology programs who have shown leadership in various community organizations while maintaining a strong academic performance. These scholarships are awarded by the Marine Institute Scholarship Committee.

The John W. side Memorial Scholarship
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SCHOLARSHIPS AND AWARDS

July 6, 1998

To the students in the Marine Institute, this program

Dale Howse, Sterling Perham, and Richard Price

Memorial Scholarship

This scholarship in memory of three students is presented to a

student enrolled in a technology program. Preference may be
given to a student in the Marine Engineering program.

The Chester and Maud Keeping Memorial Scholarship

This scholarship, in memory of Chester and Maud Keeping who

had a long association with both the marine and fishing industries

and who valued education highly, is given to a student in either

the second or third year of a technology program.

Keith R. Kirby Scholarship

This scholarship, the yearly interest from a $5,000 trust fund,

to be awarded annually to a deserving Intermediate Student

in Nautical Science of high academic achievement and who

is recommended as having a commitment to improving safety in

the marine environment.

The Labrador Scholarship

The Labrador Scholarship, the interest from an award presented
to the Institute by Northern Telecom for its distance education
program in Labrador, is awarded annually to a student from

Labrador who enrolled in a three year technology program.

Dr. Aidan Maloney Scholarship in Fisheries Resource Management

The Dr. Aidan Maloney Scholarship in Fisheries (Resource Management) was established through a generous gift by Dr. Aidan Maloney, who served the fishery of Newfoundland and Labrador in both the private and public sectors for almost fifty years. The scholarship will be given annually to a full-time graduate student enrolled in the Master of Marine Studies – Fisheries Resource Management program at the Marine Institute.

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 the second or third year of the Marine Engineering program. Recipients shall be residents of either Nova Scotia or Newfoundland and Labrador.

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. Application must be made prior to the commencement of judging.

Marine Institute Student Union Scholarships

The Marine Institute Student Union has established four scholarships which are awarded on the basis of academics 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 in the first term.

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 provinces in memory of three 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, Master Marine Engineer, 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 84 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 the daughters, sons and/or widows of those who were lost. 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.

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. Based on scholarship standing, 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.

Pangco Subsea Inc. Scholarships

This scholarship, established by PanGeo Subsea Incorporated, is awarded annually to one male and one female student in either the third or fourth year of a program in the School of Ocean Technology.

Captain Peter Parsons Memorial Scholarship

Donated by his wife and four daughters, the Captain Peter Parsons Memorial Scholarship commemorates a Newfoundland master mariner who knew the power of both the sea and 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 Newfoundland or Labradorian or whose parents are natives of the Province.

Port of St. John’s 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 will 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 up to 3 years at a value of $3000 per year. Students seeking renewal of the scholarship must remain in scholarship standing for 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 of technology program.

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 Instrumentation 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 Systems Design 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.

The 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 demonstration of personal qualities appropriate to the student’s chosen field of endeavour.

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.

Schulmberger Canada Limited Scholarships

These scholarships, 2 valued at $2000 annually, are funded through Schulmberger Canada Limited, will be available to students in the Marine Engineering Technology, Naval Architecture, Marine Engineering Systems Design and the Nautical Science programs. Awarded on the basis of scholarship standing to residents of Newfoundland and Labrador. Scholarships will be awarded to women, aboriginals, and persons with disabilities or members of a visible minority.

The Captain Michael J. Simmonds and Arthur Simmons Memorial Scholarship

This scholarship in memory of two gentlemen who had a long association with the shipping and fishing industries is awarded to a student in the Coastal Zone Management program.

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 and communications courses.

J.J. Ugland Memorial Scholarships

Valued equally at a portion of the income on the endowment, The J. J. Ugland Memorial Scholarship, 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.

Xerox of Canada Scholarship

Awarded to a student of high academic standing.

SCHOLARSHIPS AND AWARDS
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, valued at $250, 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.

MARINE INSTITUTE ENTRANCE SCHOLARSHIPS

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.

M.I. 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)
- 2 credits at the 3000 level in an elective course (may be from the courses listed above or additional courses approved by the Department of Education).

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 ensure they are awarded a scholarship if eligible.

Regulations:
- Entrance scholarships are to be awarded in the Fall Semester.
- The M.I. 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 meet the above outlined scholarship average.
- Students may receive only one internal entrance scholarship.
- Students 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 scholarship average.
- Students may receive only one internal entrance scholarship.
- Students who have previously attended other post-secondary institutions public or private, transfer students or mature students are not eligible for M.I. entrance scholarships.
- A student who is awarded an M.I. 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.

Awards 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 onetime non-renewable award.

SCHOLARSHIPS AND AWARDS

ADDITIONAL SCHOLARSHIPS
A number of external agencies provide scholarships for employees or members and their dependents. Students should make inquiries directly to the agency concerned. The following is a partial listing of scholarship sponsors:
- NAPE
- Knights of Columbus
- Royal Canadian Legion
- Korea Veterans Association
- Society of United Fishermen
- Newfoundland Light and Power Company Ltd. Employees Association
- Masonic Lodges
- Labrador Inuit Association
- The HUB
- Kinsmen
- Fishery Products International
- CUPE
- CNIB
- Imperial Oil
- National Sea Products
- Company of Master Mariners
- Scouts Canada
- Canadian Institute of Marine Engineering
- Netherwood Foundation
- Newfoundland and Labrador Amateur Sports Federation
- Gentrell Association

AWARDS:
The Gerard Butler Award
This award of marine reference books to the value of $100 is to be presented annually to a qualified student of the Ministry of Transport Nautical Certificate program. This award comes from the annual interest of a memorial trust fund set up by Mrs. Anne Butler in memory of her late husband who was lost at sea when the Arctic Explorer sank.

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.

Governor General's Bronze Medal
The Governor General's Bronze Medal is awarded at Graduation to the student who has the highest average in the final year of a three year program. Students must have carried a full academic load.

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.

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SCHOLARSHIPS AND AWARDS

MARINE INSTITUTE ADVANCED DIPLOMA ENTRANCE SCHOLARSHIPS

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.

M.I. Entrance Scholarship Average 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 M.I. 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 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 scholarship average.
- 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 M.I. entrance scholarship.
- Students 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 scholarship average.
- Students may receive only one internal entrance scholarship.
- A student who is awarded an M.I. 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.

Awards 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 onetime non-renewable award.
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<tr>
<th>Number</th>
<th>Program Type</th>
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<td>Technical Certificates</td>
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<td>125</td>
<td>Transport Canada Programs</td>
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</tbody>
</table>
UNDERGRADUATE DEGREE PROGRAMS

DESCRIPTION OF DEGREE PROGRAMS

Students must meet all regulations of the Fisheries and Marine Institute in addition to those stated in the University’s general regulations. For information concerning fees and charges, admission/readmission to the University, and general academic regulations (undergraduate), refer to UNIVERSITY REGULATIONS. For information about non-degree programs and upgrading opportunities refer to www.mi.mun.ca.

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 on campus and by distance delivery.

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 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 - Admission/Readmission to the University (Undergraduate) (http://www.mun.ca/regoff/calendar/ sectionNo=REGS-0528) or University requirements.

GENERAL INFORMATION

1. All application forms must be submitted to the Admissions Office, Office of the Registrar, Memorial University of Newfoundland, St. John’s, NL, A1C 5S7.

Table 1: Applications Deadlines

<table>
<thead>
<tr>
<th>Semester</th>
<th>Deadline for Undergraduate Applications</th>
<th>Deadline for Official Transcripts</th>
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<td>June 15</td>
<td>June 30</td>
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<tr>
<td>Winter</td>
<td>October 15</td>
<td>October 30</td>
</tr>
<tr>
<td>Spring</td>
<td>March 15</td>
<td>March 30</td>
</tr>
</tbody>
</table>

2. Students may not obtain both a Bachelor of Maritime Studies and a Bachelor of Technology degree based upon completion of the same diploma of technology.

Admission Requirements for Applicants to the Bachelor of Maritime Studies 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 Maritime Studies.

Applicants must meet the general admission/readmission requirements of the University and be eligible for admission to the Bachelor of Maritime Studies program in one of the following categories:

- **Category A:** applicants holding a diploma from the Marine Institute in nautical science, marine engineering technology, naval architecture technology or marine engineering systems design technology,
- **Category B:** applicants holding a Canadian Technology Accreditation Board accredited, or Transport Canada approved, diploma in marine engineering technology or nautical science,
- **Category C:** applicants holding a Canadian or non-Canadian diploma similar to an accredited or Transport Canada approved Marine Institute diploma in nautical science, marine engineering technology, naval architecture technology or marine engineering systems design technology,
- **Category D:** applicants holding a Transport Canada Certificate of Competency at the Master Mariner, Fishing Master First Class, or Engineering First Class level or equivalent,
- **Category E:** applicants who have Canadian Forces (Naval Operations) training acceptable to the Admissions Committee.

Applications to the program will be considered by the appropriate admissions committee(s).

In accordance with the UNIVERSITY REGULATIONS - Residence Requirements - Second Degree (http://www.mun.ca/regoff/calendar/sectionNo=REGS-0508#REGS-0521), students completing the Bachelor of Maritime Studies program, as a second degree, must complete a minimum of an additional
4. Applications to the program will be considered by the appropriate admissions committee(s).

5. Upon acceptance into the program, students will be required for admission to this degree.

Technology Program

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/admission 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 in engineering/applied science technology accredited by the Canadian Technology Accreditation Board (CTAB).

- Category C: 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 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.

- Category H: applicants who have completed the University Regoff calendar section No = REGS-0508REGS-0521, students completing the Bachelor of Technology program, 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.

DEGREE PROGRAM REGULATIONS

BACHELOR OF MARITIME STUDIES

- Students must complete 39 credit hours in addition to the work which was required under their category of admission.

- The required and elective courses are listed in Table 1 Bachelor of Maritime Studies - Course Requirements for all Students. These courses may have prerequisites which have to be met.

- When transfer credit has been granted for a course(s) taken to satisfy the requirements for admission, students must take additional university course(s).

- To meet the academic requirements for a Bachelor of Maritime Studies a candidate shall successfully complete the program with a minimum overall average of 60% and a minimum numeric grade of 50% in each course required for the degree unless stated otherwise within the course description.

- Students must take 39 credit hours with 21 credit hours from the required courses and 18 credit hours from the electives.

- At least one elective must be chosen from each of the groups A and B.

BACHELOR OF TECHNOLOGY DEGREE

- Students must complete 39 credit hours in addition to the work which was required under their category of admission.

- The required and elective courses are listed in Table 3 Bachelor of Technology - Engineering and Applied Science Technology Option and Table 4 Bachelor of Technology - Health Science Technology Option. These courses may have prerequisites which have to be met.

- When transfer credit has been granted for a course(s) taken to satisfy the requirements for admission, students must take an additional elective University course(s).

- To meet the academic requirements for a Bachelor of Technology a candidate shall successfully complete the program with a minimum overall average of 60% and a minimum numeric grade of 50% in each course required for the degree unless stated otherwise within the course description.

Bachelor of Technology Engineering and Applied Science Technology Option

- Students must take 39 credit hours with 24 credit hours from the required courses and 15 credit hours from the electives.

- At least one elective must be chosen from each of the groups A and B.

Bachelor of Technology Health Science Technology Option

- Students must take 39 credit hours with 18 credit hours from the required courses and 21 credit hours from the electives.

- At least one elective must be chosen from each of the groups A, B and C.

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 4004</td>
<td>• MSTM 4002</td>
<td>• Economics 3030</td>
</tr>
<tr>
<td>• MSTM 4040</td>
<td>• MSTM 4005</td>
<td>• Economics 3380</td>
</tr>
<tr>
<td>• MSTM 4060</td>
<td>• MSTM 4011</td>
<td>• Geography 3510</td>
</tr>
<tr>
<td>• MSTM 4090</td>
<td>• MSTM 4012</td>
<td>• Geography 4410</td>
</tr>
<tr>
<td>• MSTM 410A/B</td>
<td>• MSTM 4013</td>
<td>• MSTM 4014</td>
</tr>
<tr>
<td>• Statistics 1510 or 2500 or equivalent</td>
<td>• MSTM 4020</td>
<td>• MSTM 4030</td>
</tr>
<tr>
<td></td>
<td>• MSTM 4050</td>
<td>• Philosophy 2801</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Political Science 3210</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Political Science 4200</td>
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<td></td>
<td></td>
<td>• Sociology 2120</td>
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<td></td>
<td></td>
<td>• Sociology 3120</td>
</tr>
</tbody>
</table>

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

<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 Business 2102</td>
<td>• Economics 2010</td>
</tr>
<tr>
<td>• MSTM 4010</td>
<td>• Business 4090</td>
<td>• Economics 2020</td>
</tr>
<tr>
<td>• MSTM 4020</td>
<td>• Economics 3360</td>
<td>• Economics 3030</td>
</tr>
<tr>
<td>• MSTM 4040</td>
<td>• MSTM 4011</td>
<td>• Economics 3380</td>
</tr>
<tr>
<td>• MSTM 4060</td>
<td>• MSTM 4012</td>
<td>• Geography 3510</td>
</tr>
<tr>
<td>• MSTM 4090</td>
<td>• MSTM 4013</td>
<td>• Geography 4410</td>
</tr>
<tr>
<td>• MSTM 410A/B</td>
<td>• MSTM 4017</td>
<td>• MSTM 4014</td>
</tr>
<tr>
<td>• Statistics 1510</td>
<td>• MSTM 4050</td>
<td>• MSTM 4030</td>
</tr>
<tr>
<td></td>
<td>• MSTM 4070</td>
<td>• Philosophy 1100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Philosophy 2571</td>
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<tr>
<td></td>
<td></td>
<td>• Religious Studies 3830</td>
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<td>• Sociology 2120</td>
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</tbody>
</table>

Table 4 Bachelor of Technology - Health Science Technology Option

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Group A Electives</th>
<th>Group B Electives</th>
<th>Group C 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>
<td>• Biology 2040 or 2041</td>
</tr>
<tr>
<td>• MSTM 4000</td>
<td>• Business 4000</td>
<td>• Economics 2020</td>
<td>• Nursing 3023</td>
</tr>
<tr>
<td>• MSTM 4060</td>
<td>• Economics 3360</td>
<td>• Economics 3080</td>
<td>• Nursing 4701</td>
</tr>
<tr>
<td>• MSTM 410A/B</td>
<td>• MSTM 4011</td>
<td>• Geography 4410</td>
<td>• Psychology 2010</td>
</tr>
<tr>
<td>• Statistics 1510 or 2500 or equivalent</td>
<td>• MSTM 4012</td>
<td>• MSTM 4014</td>
<td>• Psychology 2011</td>
</tr>
<tr>
<td></td>
<td>• MSTM 4013</td>
<td>• MSTM 4015</td>
<td>• Psychology 2012</td>
</tr>
<tr>
<td></td>
<td>• MSTM 4017</td>
<td>• MSTM 4016</td>
<td>• Psychology 2800</td>
</tr>
<tr>
<td></td>
<td>• MSTM 4050</td>
<td>• Philosophy 1100</td>
<td>• Sociology 2110</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Philosophy 2551 or 2562 or 2553</td>
<td>• Philosophy 2571</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Religious Studies 3830</td>
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<tr>
<td></td>
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<td></td>
<td>• Sociology 2120</td>
</tr>
</tbody>
</table>
UNDERGRADUATE DEGREES PROGRAMS

WAIVER OF DEGREE PROGRAM REGULATIONS

Regulations (Undergraduate) - Waiver of Regulations (http://www.mun.ca/regoff/calendar/sectionNoREGS-0849). Every student also has the right to request waiver of degree program regulations.

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 by the appropriate deadline date to graduate on the prescribed "Application for Graduation" form. This form may be obtained online at the Memorial Self Service at www.mun.ca/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 of Regulations (http://www.mun.ca/regoff/calendar/sectionNoREGS-0859).

UNDERGRADUATE DEGREE PROGRAMS

4000 The Organization and Issues of Shipping will provide students with knowledge of the economic shipping environment with respect to Canada. The course will develop an understanding of basic trade theory, patterns of trade and sea routes, commodities traded by sea, and the organizational structure of shipping companies.

CR: the former Engineering 8065; Maritime Studies 4001 and 4002 The Business of Shipping will provide students with an understanding of financial performance of shipping companies as well as computing voyage and annual cash flows. The course will develop an understanding of marine insurance and forecasting, and risk management.

PR: MSTM 4001

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 seafarer 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.

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.

CR: the former Technology 4010

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 economic impact in society.

4012 Occupational Health and Safety Legislation and Management focuses on the legal aspects of 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 methods to increase their 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 of change that face highly 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. landfills, energy efficiency paradox, geo-engineering, and other select 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 Technological 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 technical problems, the tools and approaches can be used to understand and solve virtually any solvable problem.

4020 Economic Management for Technologists (formerly Technology 4040) 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.

CR: Engineering 4102; Technology 4020

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.

CR: the former Technology 4030

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.

CR: the former Technology 4040

4050 Introduction to Quality Management (formerly Technology 4050) will provide students with an understanding of the principles and techniques involved in the total quality management approach to quality management. The course covers the various tools and techniques used in quality management as well as providing an overview of the role of management.

CR: the former Technology 4050

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 4090

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.

4101A (formerly MSTM 4100 and 4200) 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 proposal and write a report. The passing grade for this course is 65%.

CR: the former MSTM 4100, the former MSTM 4200, the former Technology 4000; OR: must be completed within three consecutive semesters

PR: MSTM 4090

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.

• 4011 The Organization and Issues of Shipping
• 4012 Assessment and Implementation of Technology
• 4020 Project Management for Technologists
• 4030 Technology in the Human Context
• 4040 Project Management for Technologists
• 4050 Introduction to Quality Management
• 4060 Advanced Technical Communications
MASTER OF MARINE STUDIES (FISHERIES RESOURCE MANAGEMENT)

Vice-President of Memorial University (Marine Institute)
G. Blackwood
Academic Director
K. Rideout

ADMINISTRATION

The program is 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 and two members from other academic units 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 fishery, 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.

PROGRAMS

There are two graduate programs in Fisheries Resource Management: the Graduate Diploma and the Master of Marine Studies.

GRADUATE DIPLOMA

The Graduate Diploma in Fisheries Resource Management provides an opportunity for fisheries professionals to enhance their perspective on fishery issues from a variety of disciplines.

1. Admission Requirements

To be admitted to the Graduate Diploma in Fisheries Resource Management, a student must be eligible to register in the Master of Marine Studies program (see Master of Marine Studies, Admission Requirements below).

2. Program of Study

The program is offered online and requires successful completion of 18 credit hours of course work as follows:

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 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 either Category A or Category B Electives

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

- 6 core courses (15 credit hours)
- 2 elective courses (6 credit hours) from Category A Electives
- 1 elective course (3 credit hours) from Category B Electives
- 2 elective courses (6 credit hours) from either Category A or Category B

b. Depending 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 previously completed the requirements for the degree under 2011-2012 Calendar Regulations may apply to transfer to one of the above program options and will be considered in accordance with the following:

- 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 an additional 6 credit hours of courses as follows:

  - MSTM 6005 (for students who completed the former FRM 6000 to satisfy the 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

- Those having previously partially 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 together with 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 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 either Category A Electives
- 1 elective course (3 credit hours) from either Category B Electives
- 1 elective course (3 credit hours) from either Category A or Category B

2.2. Comprehensive Course Route

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

- 5 core courses (15 credit hours)
- 2 elective courses (6 credit hours) from either Category A Electives
- 1 elective course (3 credit hours) from either Category B Electives
- 2 elective courses (6 credit hours) from either Category A or Category B
2. Category A Electives:

- 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 6039 Sustainability and Environmental Responsibility
- MSTM 6044 Marine Environment Law and Pollution Control
- MSTM 6056 Management for International Development
- MSTM 6071 Management of Aquaculture Technology

3. EVALUATION

a. Candidates for the Master’s Degree must obtain a grade of B or better in all program courses.

b. Candidates who have received a grade less than a B in a program course will be permitted to remain in the program, provided the course is retaken and passed with a grade of B or better. Alternatively the candidate may, on the recommendation of the Program Committee, substitute another graduate course. Only one such repeat or substitution will be permitted in the program.

c. The Major Report will normally be undertaken towards the end of the program. The topic of the report and a faculty Supervisor will be chosen by the candidate in consultation with the Academic Advisory Committee. The report provides an opportunity to synthesize an original perspective on a selected fisheries issue through the examination of appropriate literature and other sources of information. Normally the report will be multi-disciplinary in nature and will result in a document equivalent to a publishable periodical journal article or a consultant’s report on a particular issue. It will be assessed in accordance with General Regulations, Theses and Reports of the School of Graduate Studies.

COURSES

1. Core Courses:
   - MSTM 6001 Fisheries Ecology (CR: the former FRM 6001)
   - MSTM 6002 Fisheries Resource Assessment Strategies (CR: the former FRM 6002)
   - MSTM 6003 Fisheries Economics (CR: the former FRM 6003)
   - MSTM 6004 Fisheries Policy and Planning (CR: the former FRM 6004; FRM 6005)
   - MSTM 6005 Overview of World Fisheries (CR: the former FRM 6009)

2. Category A Electives:
   - MSTM 6006 Business Management for Fisheries (CR: the former FRM 6006)
   - MSTM 6007 Fisheries Technology
   - MSTM 6008 Social and Philosophical Issues of Fisheries Management
   - MSTM 6009 Current Issues for Sustainable Fisheries
   - MSTM 6010 Legal Aspects of Fisheries Resource Management

3. Category B Electives:
   - 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 6039 Sustainability and Environmental Responsibility
   - MSTM 6044 Marine Environment Law and Pollution Control
   - MSTM 6056 Management for International Development
   - MSTM 6071 Management of Aquaculture Technology

ADMISSION

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 the program 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 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.

2. The deadlines for submission of applications for candidates wishing to enter studies are as follows:
   - Fall (September) Semester: May 15
   - Winter (January) Semester: September 15
   - Spring (May) Semester: January 15

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.

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:
   - 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.

PROGRAM OF STUDY

1. Candidates for the Master of Maritime Management shall be required to complete a minimum of either:
   - Twenty-four 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 6101 Project in Maritime Management (6 credit hours).
   - Core Courses (Two to be completed):
     - MSTM 6041 Marine Policy
     - MSTM 6042 Business of Shipping/Transportation of Goods

   Elective Courses (Six to be completed: a minimum of three from Category A and 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 6030 Principles of Management for Engineering Technology Enterprises
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.

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:
   - 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 Applied Science Technology Option or the Aquaculture Technology Option.

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:

   - The requirements for the Master of Technology Management (MTM) 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 technology-based organizations. It provides a technology 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 consists of two Options:
     - Engineering and Applied Science Technology Option
     - Aquaculture Technology Option

   - 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 comprehensive course work. Candidates will typically register on a part-time basis.

   - Admission to the program is on a competitive basis.

   - The deadlines for submission of applications are as follows:
     - Fall (September) semester: May 15
     - Winter (January) semester: September 15

   - 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.

   - 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.

   - 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.

   - 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:

       - 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.

   - Upon acceptance into the program, students will be admitted to one of the two Options: the Engineering and Applied Science Technology Option or the Aquaculture Technology Option.
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).

Core Courses (Two to be completed):
MSTM 6031 Overview of Technical Operations
MSTM 6032 Managing Technological Innovation

Elective Courses (Eight to be completed):
MSTM 6022 Communication and Conflict Resolution in a Technical Environment
MSTM 6023 Strategic Planning, Policy, Participation and Management in Technical Operations
MSTM 6030 Principles of Management for Engineering Technology Enterprises
MSTM 6033 Quality Systems
MSTM 6034 Project Management in the Offshore, Health, Fisheries and Engineering Technology Environments
MSTM 6035 Information Technology Applications in the Health and Engineering Technology Environments
MSTM 6036 Supply Chain Management and Advanced Engineering Technology Operations
MSTM 6037 Risk Analysis and Operations in the Engineering Technology Sector
MSTM 6038 Manufacturing and Engineering Technology Management
MSTM 6039 Sustainability and Environmental Responsibility
MSTM 6052 Management of Intellectual Property
MSTM 6054 Technology Assessment
MSTM 6056 Management of International Development

Core Courses (Two to be completed):
MSTM 6031 Overview of Technical Operations
MSTM 6032 Managing Technological Innovation

Elective Courses (Six to be completed 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
MSTM 6039 Sustainability and Environmental Responsibility
MSTM 6052 Management of Intellectual Property
MSTM 6054 Technology Assessment
MSTM 6056 Management of International Development

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

Project in Aquaculture Technology Management
MSTM 6102 Project in Aquaculture Technology Management (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 technology management and fully document and present their findings. Preferably the problem will be directly related to a workplace situation.

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). Students on the project route will complete MSTM 6102: Project in Aquaculture Technology Management (6 credit hours).

Core Courses (Two to be completed):
MSTM 6031 Overview of Technical Operations
MSTM 6032 Managing Technological Innovation

Elective Courses (Eight to be completed at least from three from Category B)
The food and beverage processing sector is the second largest manufacturing industry in Canada shipping $87.8 billion worth of goods in 2008 and employing more the 256,000 people. It is a very competitive industry with manufacturers continually developing new products and updating their technology. As a result, there is a great demand for qualified graduates for a wide range of activities. They include the management of the food process itself; maintenance of the nutritional quality of food; assurance of the food quality and purity; and development of new products.

The Joint Diploma of Technology/Bachelor of Technology in Food Technology addresses the human resource needs of this vast industry while meeting the desire for a Bachelor Degree in this field.

**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 OUTLINE**

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

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

**TERM 3**
BIOL 2105 (Microbiology)
BSMG 3200 (Introduction to Business)
CHEM 2103 (Organic Chemistry)
FDTE 2105 (Nutrition)
FDTE 2112 (Food Safety and Sanitation)
MATH 1200 (Calculus)
WKTM 1002 (Work Term Preparation Seminar)

**TERM 4**
BSMG 2209 (Product Development)
BSMG 3118 (Technical Problem Solving)
CHEM 3102 (Bio-chemistry)
CHEM 3200 (Physical Chemistry)
FDTE 2202 (Food Processing I)

**TECHNICAL SESSION I**
FDTE 2118 (Canned Food 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)
QLAS 2104 (Food Evaluation)

**WORK TERM I**
WKTM 2107 (Work Term - Food Technology)

**TERM 5**
BIOL 2202 (Food Microbiology)
ENGL 1080 (Critical Reading and Writing I)
FDTE 2103 (Food Engineering Principles)
FDTE 3106 (Seafood Processing Technology)
QLAS 3101 (Quality Assurance)
B.Tech Elective

**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 4080 (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 (Economic Management for Technologists)
MSTM 410B (Technical Project and Report II)
B. Tech. Elective
B. Tech. Elective

**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.
The Ocean Mapping program is designed to:

- 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 acoustics 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 technologies to 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 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 Nautical Science and Marine Safety. The Nautical Science course will cover introductory navigation concepts and techniques. The Marine Safety courses will focus on Confined Space Entry Awareness and Small Vessel Operator Proficiency. Additionally students complete a ROV Survey Operation course that focuses on the operation of remotely operated vehicles as a means of conducting elements of a hydrographic survey. All of these courses are very relevant when working within the marine environment.
- Immediately following the third Technical Session, students will begin a comprehensive work term placement component whereby the students are fully immersed with an ocean mapping related company and performing the tasks required within industry. The duration of the work term is flexible as design by as it will reflect the individual job duties of each student. Students are required to complete either an eight-week work term or a total of 320 hours to fulfill the requirements for successful completion.

The final year of the Ocean Mapping program builds on all the fundamental concepts learned throughout the duration of the program and allows the students to fully immerse themselves in the project management side of the technology. Students will:

- Complete the first course for the capstone project required prior to graduation whereby the students design and develop a new ocean management data management project in semester seven. This projects aim is to link all the concepts and techniques together through the design, development and dissemination of a relevant issue or trend in ocean mapping. The topics are wide in scope and can range from intermediate data collection techniques and practices to the development and implementation of commercial software. The implementation and dissemination of the capstone project will take place in semester eight. Students will also complete a Nautical Chart Production course adhering to acceptable hydrographic standards as well as a Weather and Climate course to round out the students’ expertise.

Students will continue with the Bachelor of Technology Degree requirements, including the beginning of their technical project associated with the Bachelor of Technology Degree.

In semester eight, the final semester of the program, students finish up the Bachelor of Technology Degree requirements as well as the implementation and dissemination of the ocean mapping capstone project. Students also complete two ocean mapping application courses that pertain to the International Law of the Sea and the perspective of Geomatics as well as the applications of Ocean Mapping across various disciplines within industry, applied research and academia.

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 is in the process of attaining accreditation from two different governing bodies. The Ocean Mapping Program will be accredited under the Canadian Technology Accreditation Board (CTAB) for national recognition in the field of Surveying and Geomatics. The Ocean Mapping Program is a Joint Diploma / Degree program and an incorporated Bachelor of Technology components from Memorial University of Newfoundland and Labrador (MUN), indicating its Degree recognition. Additional accreditation will be pursued and attained as part of successful implementation of the full program.
CAREERS

Information about the industry

- Ocean Mapping graduates will be entering a broad and diverse field that has a variety of specific niches that require the services and expertise within this program and through their training, the students will easily and seamlessly fit in to any business model. Until now, there was never a formal job title of Ocean Mapper because the typical roles were traditionally performed by a group of people. Graduating as an Ocean Mapper, students will be technologically literate and competent in all the sectors of the industry, thus making them extremely employable and attractive to local, national and international companies.

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
- Special Projects Team Lead
- Hydrographic Surveyor
- Database Administrator
- Computer Programmer
- 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)
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 (AUAV) 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 visualisation & 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-metre GPS applications, including data acquisition and post-processing;
• Abilities in a relevant language such as C++, Python etc an advantage;
• 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.

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/prepare data for web sites, configure map server settings, and create static HTML content.

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.

SAMPLE JOB DESCRIPTION
• Typical activities for an Ocean Mapper graduate are as follows:

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/prepare data for web sites, configure map server settings, and create static HTML content.

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 visualisation & 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-metre GPS applications, including data acquisition and post-processing;
• Abilities in a relevant language such as C++, Python etc an advantage;
• 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.

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

Main Areas of Study
• In the first year, students begin studying math, physics, chemistry, electro-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 the work for the graduates in the ROV industry. On the operational side, computer interfacing techniques, data communication, and acoustics applications help in understanding the internetworked systems that comprise ROV.
• Following Term 4, 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 adds a practical dimension to the theoretical fundamentals.
• 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 Four if necessary.
• 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 Four if necessary.
• 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 Four if necessary.

MISSION
The underwater vehicle program is a 4 year applied program designed to:
• Provide graduates with solid technical skills to operate, maintain and repair all classes of remotely operated and autonomous underwater vehicles (ROVs and AUAVs);
• Train students in ROV deployment methodologies that encompass safety, inspection and operation;
• Prepare students for careers in offshore oil & gas, nuclear, military, law enforcement, pipeline and cable industries as a substitute to diving operations;
• Graduate students with a 3 year Marine Institute (MI) Diploma of Technology complimented by a Memorial

PROGRAM STRUCTURE
Length of the Program
• 4 academic years

Number of semesters
• Eight (8) 13 week academic semesters, two technical sessions and a work term

Number of courses
• 59 courses in 4 years of study

Work terms
• Students do a work term at the end of semester 6

Topics covered in each semester
• Refer to program calendar – Main areas of study

Physical requirements
• Students will be required to complete a 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 Oceanography)
- SFTY 1104 (WhMIS)

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

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

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

**TECHNICAL SESSION 1**
- ELTR 1104 (Electronic Fabrication Techniques)
- ENGR 1202 (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 5**
- ELTR 2202 (Analog Transistor Circuits)
- ELTR 3122 (Embedded Controllers)
- English 1000 Level Course
- MATH 1200 (Calculus) For Rov Diploma Laddering Only
- MSTM 4014 (Technology and the Environment)
- MSTM 4080 (Introduction to Technology)

**TERM 6**
- CHEM 1100 (Chemistry) For Rov Diploma Laddering Only
- ELTR 3120 (Integrated Circuits)
- MATH 2101 (Advanced Calculus)
- MSTM 4010 (Assessment and Implementation of Technology)
- MSTM 4040 (Project Management for Technologists)
- MSTM 4060 (Advanced Technical Communications)
- ROVO 3200 (Automated Underwater Vehicle Design & Operations)

**TECHNICAL SESSION II**
- (Ethics and Technology Management)
- MSTM 4010 (Assessment and Implementation of Technology)
- or Rov Diploma Laddering Only
- (Pilot Training - 4 weeks)
- ROVO 2300 (ROV Ship Interaction)
- ROVO 2301 (ROV Pilot Training)
- ROVO 2303 (ROV Simulator - Advanced)
- (Safety Training - 2 weeks)
- SFTY 1102 (Marine 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 2301 (Fall Protection)

**WORK TERM**
- WKTM 1105 (Work Term)

**TERM 7**
- ELTR 3104 (Digital Signal Processing)
- ELTR 3211 (Control Devices & Systems)
- MSTM 4020 (Economic Management for Technologists)
- MSTM 4100 (Technical Project I)
- STAT 2108 (Applied Statistics)
- WKPR 1117 (Machine Shop I)

**TERM 8**
- B.Tech Elective
- MSTM 4012 (Occupational Health and Safety Legislation and Management)
- MSTM 4030 (Technology in the Human Context)
- MSTM 4070 (Special Topics in Technology)
- MSTM 410B (Technical Project II)
- TKPR 3500 (Electro-Mechanical Fabrication Project)

**WORK TERM**
- WKTM 1105 (Work Term)

**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, hydraulics, electronics, electrical, and general workplace safety. There are few educational institutions in the world that offer ROV training.

**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**
- 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
- • 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
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 food safety systems that exist within the Canadian food industry. Quality and the Food Industry; Quality Assurance Program; Specifications; Raw Materials/Ingredient Supplier Certification; Product Control; Production and Process Control; Product Traceability; HACCP Documentation and Traceability System; and the Food Industry

Schedule - Web-based instruction: 39 hours

MIPG 4105M - Introduction to Process Control - This course is designed to provide students 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 Materials/Ingredient Supplier Certification; Process Control; Production and Process Control; Product Traceability; HACCP Documentation System; and the Food Industry

Schedule - Web-based instruction: 39 hours

MIPG 4106M - Project Management Fundamentals - This course is designed to introduce students to the processes and tools involved in initiating, planning, executing, controlling, and closing projects.

Schedule - Web-based instruction: 39 hours

MIPG 4107M - European Food Law - This course will provide participants with a thorough and in-depth understanding of the elements of European (EU) Food Law including aspects of food science, health, law, ethics, policy, economics and politics. European Union and Principles of EU Food Regulatory Affairs; Trade and Free Movement of Food in the EU; International Influences on EU Food Law; European Food Safety Authority; Precautionary Principle; EU Food Hygiene, Food Safety Legislation and Food Quality; EU Food Standards; Food Labeling and Naming of Foods; Nutritional Food Law in EU; Food Additives; Food and Health Functional Foods; Genetic Modification of Foods; Organic Food Production; Artisan and Specialty Foods

Schedule - Web-based instruction: 39 hours

MIPG 4108M - ISO Management Systems - This course is designed to introduce internationally developed management systems to students. The course provides learning opportunities around the application of these systems and the procedures followed for their implementation in different firms and institutions. Background; ISO 9000 Quality Management System; ISO 14001 Environmental Management System; OHSA 18000 Occupational Safety and Health Management System

Schedule - Web-based instruction: 39 hours

MIPG 4113M - Introduction to Food Safety - This course is designed to introduce students to the fundamental control measures required to produce safe foods both 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

Schedule - Web-based instruction: 39 hours

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

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 Photochemicals, Environmental Toxics, Animal Drug Residues, Food additives, Toxins formed during Food processing, Important facts of Foodborne Diseases, Foodborne intoxications, Foodborne Infections, Foodborne Toxin infections, Parases and Algal Toxins, Food Insestivities

Schedule - Web-based instruction: 39 hours

MIPG 4116M - Food Sanitation - 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 of less than 65% 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
Professionals will enhance their careers in the private and public sectors specializing in food technology/production, food safety, quality management, project management and quality assurance.

Programs in the program are 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.
The elective course selection will expand to include a wide range of courses:

- MIPG 4108M - ISO Management Systems
- MIPG 4107M - European Food Law
- MIPG 4106M - Project Management Fundamentals
- MIPG 4105M - Introduction to Process Control
- MIPG 4104M - Quality Assurance in the Food Industry
- MIPG 4103M - Technical Problem Solving
- MIPG 4102M - Food Safety Systems
- MIPG 4101M - Technical Communication for Quality Management
- MIPG 4100M - Quality Management

Elective Courses:

- MIPG 4100M - Quality Management

**Program Structure**

This Web-based program consists of four courses: one core and three electives. Learning online will allow you to interact with a virtual community consisting of other quality professionals and your instructor.

**Required Course:**

- MIPG 4100M - Quality Management

**Elective Courses:**

- MIPG 4101M - Technical Communication for Quality Management
- MIPG 4102M - Food Safety Systems
- MIPG 4103M - Technical Problem Solving
- MIPG 4104M - Quality Assurance in the Food Industry
- MIPG 4105M - Introduction to Process Control
- MIPG 4106M - Project Management Fundamentals
- MIPG 4107M - European Food Law
- MIPG 4108M - ISO Management Systems

The elective course selection will expand to include a wide range of disciplines as the program progresses.
This program is designed to provide students, from a wide range of academic disciplines, with the education, training and management level skills required to participate in aquaculture development.

The goals of this program are to provide students with:

- education and training for employment in a wide variety of fish and shellfish culture vocations.
- management level training needed to ensure the logical & sustainable development of aquaculture industries.

**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 fish health, 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, statistics, business management, aquaculture & the environment, 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.

**Program Outline**

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<td>AQUA 4102 (Shellfish Culture)</td>
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<td>* SFTY 2102 (MED A3)</td>
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**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 variety of teaching and applied research programs. 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 Memorial University. Students in this program may be required to complete selected courses from the Advanced Diploma in Sustainable Aquaculture. 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.
The Marine Institute Advanced Diploma in Integrated Coastal and Ocean Management allows graduates of degree and diploma programs to specialize in the multi-disciplinary elements associated with integrated coastal zone and ocean management. The program of study focuses on the biophysical, ecological, socio-economic, cultural and technological elements of coastal zone development and management.

Graduates gain an integrated view of the issues and alternative solutions to the conflicts which may arise from multiple uses of coastal zones. They will be familiar with methods and tools for working with various constituents in the use and management of coastal zone and ocean areas. The focus is to support and facilitate the sustainable development of these regions and the resolution of complex issues with decision makers, planning agencies, community agencies and other constituents.

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

**PROGRAM STRUCTURE:**
The program has been structured in a four term format that will be delivered in 3 thirteen (13) week terms, and 1 six (6) week technical session.

**Term One (13 weeks):**
The first term is descriptive in nature, providing first a general overview of the elements and disciplines required for the management of the oceans and the coastal zones. Its aim is to standardize the background of the participants from different disciplines entering the program.

The information provided will serve as the basis for further analysis and integration in the following terms.

The first term includes a description of the ecological, human, and socioeconomic factors in coastal ecosystems and the methods and technologies utilized to implement management.

**Term Two (13 weeks):**
This term is analytical in nature, providing a review and critical analysis of multiple user conflicts and interdisciplinary subjects that interact in the oceans and the coastal zone. Increased emphasis is placed on legal and human aspects of coastal zone management and methods and technologies.

**Technical Session (6 weeks):**
This session is designed to expose students to some of the physical applications available in the field of integrated coastal and ocean management.

**Work Term (13 weeks):**
The students will be 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 retake 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 HIGHLIGHTS**
The advanced diploma in integrated coastal and ocean management is designed to equip graduates with in-depth knowledge and the practical skill necessary to be effectively involved in coastal zone management. Seminar-based teaching methods are used wherever appropriate. The program is designed to have an international focus and address topics of relevance to both developed and developing nations. For this reason the program was developed in close consultation with international experts in coastal zone management. It is anticipated that a significant proportion of graduates will follow international employment opportunities.
CARERS
Three quarters of the World’s population live in coastal regions. As land resources become scarcer, the next century will see growth in coastal population and increased pressure on marine resources. This trend has created the need for an integrated rather than sectorial management strategy. This program is designed for people interested in careers related to planning or management of coastal and ocean activities and or coastal zone development programs. This would include persons working for organizations active in the following areas:

- Environmental, natural resource and fisheries management.
- Non-governmental environmental and community development organizations.
- Educational institutions with coastal related research and public service programs.
- Foreign assistance agencies with natural resource and public service programs.
- Development Banks with environmental and natural resources units.
- Government agencies involved with coastal resources management.
- International consulting in the area of multi-stakeholder conflict resolution.
- Marine recreation and nature tourism.

CAREERS

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.

CAREERS

While the program is designed to focus the students’ academic and technical competencies specific to the water quality field, their undergraduate 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.
DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING TECHNOLOGY

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

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 180 days minimum)

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

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@mi.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 Mechanics.
• 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 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.

DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING TECHNOLOGY

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 preparation of commissioning and inspection reports.
• Marine surveyors for Transport Canada and other inspection, insurance and class 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 design, construction, fitting out and acceptance of new vessels.

Sample Job Description - Ship Based
• Fulfill 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.
DIPLOMA OF TECHNOLOGY - MARINE ENGINEERING TECHNOLOGY

**PROGRAM OUTLINE**

**Term 1**
- CMSK 1105 (Technical Communications I)
- ENGR 1102 (Electrotechnology)
- TRMO 1105 (Thermodynamics)
- MREK 2111 (Marine Engineering Knowledge I)
- MATH 1105 (Introductory Calculus)
- WKPR 1200 (Welding Shop I)
- WKPR 1109 (Welding Shop I)
- WORKSHOP 1

**Term 2**
- CMSK 1205 (Technical Communications II)
- ENGR 1202 (Electrotechnology)
- TRMO 1105 (Thermodynamics)
- FLDS 2105 (Fluid Mechanics)
- MATH 1105 (Introductory Calculus)
- MREK 1201 (Marine Engineering Knowledge II)
- WKPR 1200 (Welding Shop I)

**Technical Session I**
- ENGR 1104 (Engineering Graphics)
- MTPR 1300 (Materials & Processes)
- SFTY 1106 (Marine Advanced First Aid)
- SFTY 1104 (Basic Safety - STCW'95 VII)
- WKPR 1109 (Welding Shop I)

**Term 3**
- ELTK 3203 (Rotating AC Machines)
- ELTR 3203 (Electrical Devices & Digital Systems)
- MREK 3107 (Marine Engineering Knowledge V)
- TRMO 3107 (Thermodynamics)
- WKPR 3206 (Welding Shop III)

**Program Entry**

The program is structured in a three year format to be delivered in six academic semesters, two practical skills training sessions, one work term and one professional orientation session.

The first two terms include courses that are common to other Marine Institute technology programs, such as communication skills, mathematics, physics, and engineering graphics, as well as courses in chemistry, biology, computer applications, and an introduction to issues in the Marine Environment. After Term 2 students will participate in the first practical skills session, which is seven weeks in duration. The first practical session includes safety courses such as MED-A1 and marine sampling.

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 Structure**

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 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.

**Program Highlights**

DIPLOMA OF TECHNOLOGY - MARINE ENVIRONMENTAL TECHNOLOGY

**Program Entry:**

Please refer to the Admissions section of this Calendar.

**Program Structure:**

The program is structured in a three year format to be delivered in six academic semesters, two practical skills training sessions, one work term and one professional orientation session.

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- 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 species. 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

Program Outline

Term 1
BIOL 1100 (Biology)
CHEM 1101 (General Chemistry I)
CMSK 1102 (Technical Communications)
ENGR 1103 (Engineering Graphics)
One of: MATH 1100 (Pre-Calculus)
or
MATH 1101 (Introduction to Calculus)
PHYS 1100 (Physics)

Term 2
CHEM 1201 (General Chemistry II)
CMSK 1201 (Communication at Work)
CPSK 1103 (Computer Database and Spreadsheet Applications)
MENV 2100 (Marine Environment)
One of: MATH 1101 (Introduction to Calculus)
or
MATH 1200 (Calculus)

Technical Session 1 (Practical Skills)
MENV 1100 (Sampling I)
MENV 1101 (Industry Visitation)
MENV 2103 (Basic Oil Spill Responder)
SFTY 1101 (Standard First Aid)
SFTY 1104 (Workplace Hazardous Materials Information System)
SFTY 1108 (MED A1)
SFTY 1121 (Equipment and Site Safety)
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 2105 (Microbiology)
CHEM 2103 (Organic Chemistry)
CMSK 2101 (Technical Communications)
MATH 1200 (Calculus)
ONGR 2103 (Oceanography)
SFTY 2101 (H2S Alive)
STAT 2108 (Applied Statistics)
WKTM 1002 (Work Term Preparation Seminar)

Term 4
BSMG 2104 (Policy and Law)
CHEM 2202 (Environmental Chemistry I)
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)

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, nationally recognized by the Canadian Council of Technicians and Technologists/Canadian Technology Accreditation Board, is designed to:

- to provide a strong technical education in ship piping, machinery & propulsion systems design supported by a good knowledge of marine engineering and naval architecture
- to provide a good technical education in general mechanical engineering technology
- to prepare students for employment in marine, offshore and land based environments
- to 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 ship auxiliary systems, ship 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.

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 designed a laptop program. Students receive a state of the art IBM 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 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 to the certification opportunities described, 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 1001 (Prime Movers & Auxiliary Power Plants)
ENSY 1202 (Introduction to Marine Engineering Systems Design)
One of:
- MATH 1100 (Pre-Calculus)
- MATH 1101 (Introduction to Calculus)
PHYS 1100 (Physics)
SFTY 1104 (W/H/M/S)

Term 2
ENGR 1201 (Introduction to AutoCAD)
FLDS 2100 (Fluid Mechanics)
One of:
- MATH 1100 (Pre-Calculus)
- MATH 1101 (Introduction to Calculus)
- MATH 1200 (Calculus)
MECH 2102 (Mechanics)
MTPR 2104 (Materials and Processes)

Technical Session 1
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)

Term 5
ELTK 2102 (Marine Electrical Systems)
ENSY 3102 (Propulsion Arrangement Design)
ENSY 3300 (Ship Engineering Project)
ENSY 3303 (Ship Stability for MESD)
FLDS 2201 (Marine Hydraulics)
TRMO 3103 (Thermodynamics)

Technical Session 3
BMSG 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 2
BMSG 3105 (Shipyard Management)
ENSY 3305 (Project Presentation)
NARC 3209 (Offshore Structures)

PHYSICAL REQUIREMENTS
NOT Applicable
The goal of the Marine Engineering Systems Design Technology Program is to prepare students for careers particularly in ship building/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, and marine engineering companies. Some students find employment with the Canadian Navy, refineries and pipelines industry.

The Program provides opportunities 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.

**Evaluation:**
- **Cumulative average of 60%**

**Graduation Requirements:**
- 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:**

**Ship 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.
- Preparing inspection reports and the field data.

**Repair Estimator:**
- Working under supervision of an engineer, assists in field data requisition, work scope estimation and analysis.
- Preparing needed drawings and sketches by hand or in CAD.
- Preparing 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 spools.
- Identifies production problems and implements solutions.
- Preparing inspection reports and develops required inspection forms.

**Ship Propulsion Designer:**
- Will work under supervision of an engineer and may have supervision over detailing draft persons.
- Preparing shafting assembly drawings using CAD or by hand and performs classification calculations.
- Maintains technical liaison with clients, classification societies and contractors.
- Assists in investigations and prepares reports.

**PHYSICAL REQUIREMENTS**

Applicants seeking entry to the 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.

**Program Structure**

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 entire program consists of:
- First Year consists of one semester one and two followed by an eight-week technical session and:
  - a two-month sea phase following the first technical session;
  - a second or intermediate year of study consisting of semesters three and four, followed by an eight-week technical session;
  - a fifteen-month sea phase following the second technical session. This sea phase may be completed over two work term periods; and,
  - a third or advance year of study consisting of semesters five and six followed by a final eight-week technical session.

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 marine sciences, 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.

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 real-life 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.

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 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.

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 operation of bridge resource management which, in part, is carried out on the Institute’s full mission bridge simulator.

**Marine Safety Directorate**

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

**Program Structure**

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.

**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.

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 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
Sea Phases
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 Placement Office. 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.

The first sea phase (WKTM 1102) is scheduled over a two-month period between the end of the first technical session and the beginning of the following semester. 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.

PROGRAM HIGHLIGHTS
This program prepares graduates for a successful sea-going career as a ship's officer. Transport Canada recognizes the professional competence of Marine Institute graduates through the provision of exemptions for specific certification examinations. Graduates also have the option of pursuing further education.

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.

PROGRAM OUTLINE

<table>
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<tr>
<th>Term 1</th>
<th>Term 2</th>
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<tbody>
<tr>
<td>CHEM 1100 (Chemistry)</td>
<td>NASC 1204 (Seamanship I)</td>
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<tr>
<td>CMST 1105 (Technical Communications I)</td>
<td>NASC 1104 (Seamanship I)</td>
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<tr>
<td>ENGR 1105 (Engineering Graphics)</td>
<td>PHYS 1104 (Physics)</td>
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<tr>
<td>MATH 1112 (NASC Mathematics I)</td>
<td>SFTY 1104 (WHIMIS)</td>
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<tr>
<th>Term 3</th>
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<tr>
<td>NASC 1303 (Shipboard Skills)</td>
<td>MREK XXXX (Marine Engineering Knowledge)</td>
</tr>
<tr>
<td>NASC 2107 (Restricted Operator’s Certificate - Maritime Commercial)</td>
<td>NARC 2102 (Ship Building)</td>
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<tr>
<td>NAVS 2101 (Stability)</td>
<td>NASC 2101 (Ship Building)</td>
</tr>
<tr>
<td>NASC XXXX (Leadership and Teamwork)</td>
<td>NASC XXXX (NS &amp;I 2))</td>
</tr>
<tr>
<td>SFTY 1106 (Marine Advanced First Aid)</td>
<td>SFTY 1118 (Advanced Firefighting (STCW'95 VI/3) &amp; Officer Designated Security Duties)</td>
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<tr>
<td>SFTY 1114 (Basic Safety - STCW'95 VI/II)</td>
<td>SFTY 1129 (Security Awareness Training for Seafarers with Designated Security Duties)</td>
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<tr>
<td>SFTY 1117 (Survival Craft - STCW'95 VI/2)</td>
<td>SFTY 1123 (Oil and Chemical Tanker Familiarization STCW’95)</td>
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<td>SFTY 1124 (Confined Space Entry Awareness)</td>
<td>SFTY 1120 (Advanced Firefighting, STCW'95 VI/3)</td>
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<tr>
<td>SFTY 1129 (Security Awareness Training for Seafarers with Designated Security Duties)</td>
<td>SFTY 1125 (Introduction to Cargo Operations)</td>
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<tr>
<th>Term 5</th>
<th>Term 6</th>
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<tbody>
<tr>
<td>NARC 2300 (Navigation Systems &amp; Instruments)</td>
<td>BSMG 3122 (Law and Environment)</td>
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<tr>
<td>BSMG 3205 (Ship Management)</td>
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<tr>
<td>NAVS 3200 (Ship Management)</td>
<td>NASC 3210 (Navigation Systems &amp; Instruments)</td>
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<tr>
<td>NASC 3208 (Stability)</td>
<td>NASC 3201 (Seamanship III)</td>
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<tr>
<td>NASC 3209 (Advanced Navigation Safety)</td>
<td>NASC XXXX (Leadership and Teamwork)</td>
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<tr>
<td>NASC XXXX (NS &amp;I 2))</td>
<td>‘NASC 2300 (Navigation Systems - SEN)’</td>
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<tr>
<td>NASC 3211 (Seamanship III)</td>
<td>NASC 3303 (Bridge Watchkeeping)</td>
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<tr>
<td>NASC 3310 (Transport Canada OOW Exam Preparation)</td>
<td>NASC 3130 (Transport Canada OOW Exam Preparation)</td>
</tr>
<tr>
<td>SFTY 1118 (Advanced Firefighting (STCW’95 V13) &amp; Officer Certification)</td>
<td>SFTY 1118 (Advanced Firefighting (STCW’95 V13) &amp; Officer Certification)</td>
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- Successful completion required as partial requirement for SEN 1 (Transport Canada credit)
- In order to get a credit for Seamanship 2100 a pass must be obtained in the Morse Light section of the course.

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

Credit Earned: Diploma of Technology
4 years:
(6 Academic Terms, 3 Technical Sessions and 2 Sea Phase Work Terms)

Normal Start:
Fall
School of Maritime Studies
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 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 ships’ 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 operation.
• 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.

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 Rhinoceros.
• 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 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 design package includes: computer-generated hull lines, general and machinery arrangements, capacity plan and structural drawings all supported by stability analyses, scartling determination from classification society rules, powering calculations and applicable national and international standards.

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)
MECH 2102 (Mechanics)  
MTPR 2101 (Materials and Processing)  
NARC 1106 (Boat Design - Composite Structure)  
NARC 1300 (Boat Design-Fabrication)  
NARC 2107 (Ship Building)  
NARC 3108 (Boat Design - Composite Structure)  
NARC 3203 (Hull Form Design Project)
Term 3
CMSK 2101 (Communication at Work)  
CPSK 1300 (Computer Skills)  
NARC 1101 (Ship Hull Geometry)  
NARC 2017 (Ship Building)  
NARC 2102 (Ship Stability)  
NARC 2207 (Ship Building)  
NARC 2208 (Ship Building)  
NARC 2209 (Ship Building)  
NARC 3109 (Shipbuilding Technology)  
NARC 3201 (Design of Strength)  
NARC 3103 (Ships and Shipping)  
NARC 3104 (Design Project)  
NARC 3108 (Ship Design - Composite Structure)  
NARC 3303 (Design of Strength)  
NARC 3304 (Ship Design Project)  
NARC 3306 (Design of Strength)  
NARC 3307 (Ship Design Project)  
NARC 3309 (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 Lloyds 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 refit.
- 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 refit 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.

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
**PROGRAM OUTLINE**

**TERM 1**
- CMSG 1100 (Introduction to Technical Reporting)
- ELTK 1100 (Electrotechnology)
- ENGR 1101 (Engineering Drawing)
- MATH 1100 (Pre-Calculus)
- MREC 2103 (Marine Engineering Knowledge)
- PHYS 1100 (Physics)
- SFTY 1104 (WHMIS)
- WKPR 1103 (Fitting Shop)

**TERM 2**
- CHEM 1100 (Chemistry)
- CMSG 1200 (Technical Reporting)
- ELTK 1200 (Electrotechnology)
- MATH 1101 (Introduction to Calculus)
- MECH 1100 (Mechanics)
- MREC 2203 (Marine Engineering Knowledge)
- WKPR 1104 (Machine Shop)

**TERM 3**
- CNTL 2102 (Instrumentation, Controls and Automation)
- ELTK 2103 (Electrotechnology)
- ELTR 1101 (Electronics for Instrumentation)
- FLDOS 2100 (Fluid Mechanics)
- MREC 3103 (Marine Engineering Knowledge)
- TRMO 2100 (Thermodynamics)

**TERM 4**
- CNTL 2105 (Electro-Mechanical Logic)
- CNTL 2202 (Instrumentation, Controls & Automation)
- FLDOS 3100 (Hydraulics and Pneumatics)
- MREC 3201 (Marine Engineering Knowledge)
- MREC 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.

**MISSION**

This two year ROV program is designed to:

- Train students in ROV piloting, hydraulics, electrical, and 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, 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 ROVs, and ROV pilotage 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 safety, launch / recovery, piloting, and repairing ROVs, preparing them for initial employment as a ROV operator on their first ROV crew.

**PROGRAM STRUCTURE**

Length of the Program:
- 2 academic years (1 year for Advanced Standing students)

Number of Semesters:
- 4 academic years, 2 academic semesters, 2 (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 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.
TECHNICIAN DIPLOMA - REMOTELY OPERATED VEHICLES (ROV OPERATOR)

PROGRAM OUTLINE

TERM 1
CMSK 1104 (Introduction to Technical Reporting)
ELTR 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)
FLDS 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 (Electronic Fabrication Techniques)
ENGR 1202 (ROV Drafting and Blueprints)
ONGR 1301 (Instrumentation-Oceanography)
NASC 1304 (Seamanship for Ocean Technology Technicians)
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)
ELTK 2118 (High Voltage Safety)+
FLDS 2109 (Advanced Hydraulics)
ONGR 1200 (Descriptive ONGR) For Advanced Standing Students Only
ROVO 2200 (Introduction to ROV Systems) For Advanced Standing Students Only
ROVO 2201 (ROV Operations)
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
ROVO 2205 (ROV Maintenance and Launch and Recovery Systems (LARS))

TECHNICAL SESSION 2
(Pilot Training - 4 weeks)
ROVO 2300 (ROV Ship Interaction)
ROVO 2301 (ROV pilot Training)
ROVO 2303 (ROV Simulator - Advanced)

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, 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.
This is a technical certificate-level program designed to up-grade the skills of existing mussel farm workers and to train new employees for entry into the mussel 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 mussel 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 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))

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 2102 (IMED A3 - Marine Emergency Duties for Small Vessels)

NASC 2107 (Restricted Operator’s Certificate – Maritime Commercial)

AQUA 0014 (500540) (Basic Farm Safety)

**ELECTIVES (Mussel and Other Sector) — Complete 6 courses**

500553 (Mussel Site Maintenance)

500558 (Mussel Marketing and Management)

500548 (Basic Mathematics for Aquaculture Workers)

500523 (Outboard Motor Maintenance)

500504 (Marine Hydraulics)

500505 (Small Diesel Repair and Maintenance)

FITE 0005 (500547) (Ropework)

500544 (Vessel Maintenance)

500541 (Farm-Based Quality Certification)

SFTY 2102 (MED A3 - Marine Emergency Duties for Small Vessels)

NASC 2107 (Restricted Operator’s Certificate – Maritime Commercial)

AQUA 0014 (500540) (Basic Farm Safety)

This 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 (Mussel and Other Sector):

500537 (Mussel Farm Stocking Capacity)

500535 (Mussel Farm Stocking Capacity)

1 Work Experience (minimum of 25 days; work time credited after completion of 3 Mussel Sector core courses)

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 2102 (IMED A3 - Marine Emergency Duties for Small Vessels)

NASC 2107 (Restricted Operator’s Certificate – Maritime Commercial)

AQUA 0014 (500540) (Basic Farm Safety)

This 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 is an awareness-level course that will provide participants with basic knowledge in oil spill response.

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 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 is an awareness-level course that will provide participants with basic knowledge in oil spill response.

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.

FITE 0005 (500547) (Ropework)

This will be designed to develop the participant’s ability to understand and construct 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 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 Survival – Survival Camp survival.

500544 (Vessel Maintenance)

This will be designed to give workers/participants a working knowledge of small vessel preventative maintenance and repairs.

500541 (Farm-Based Quality Certification)

This course will be designed to provide the participants with an overview of quality assurance and certification processes that may impact a farm’s operational procedures and ultimately the marketing of its products.

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 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 is an awareness-level course that will provide participants with basic knowledge in oil spill response.
**Technical Certificate - Aquaculture (Salmonid)**

This is a 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)
- 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-3))**

As delivered by an approved training provider.

500524 (Salmonid Biology and Husbandry)

This is an introductory course designed to give workers/participants an overview of salmonid biology, and principles and practices of general salmonid husbandry. It includes the biological processes and major organ systems of salmonids, the importance of record keeping, principles of salmonid husbandry techniques, water quality monitoring, and the impacts associated with capture and handling stresses.

500525 (Salmonid Feeds and Feeding)

This course is 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.

500526 (Salmonid Health and Biosecurity)

This is an introductory course focused on the identification and treatment of common salmonid diseases and related biosecurity procedures. It includes the monitoring of fish health, proper biosecurity procedures, recognizing and reporting possible disease concerns, undertaking standard disease prevention measures, and safe pathogen handling and reporting procedures.

500539 (Aquaculture Work Experience)

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) — Complete 1 course**

**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)**

**AQUA 0014 (500540) (Basic Farm Safety)**

**SFTY 0002 (202310) (Oil Spill Response Awareness)**

**Electives (Salmonid and Other Sector) — Complete 6 courses**

500549 (Salmonid Cage Maintenance)

500531 (Salmonid Site Maintenance)

Aquaculture (Salmonid)

500533 (Salmonid Hatchery and Recirculation Technology)

500548 (Basic Mathematics for Aquaculture Workers)

500523 (Outboard Motor Maintenance)

MARP 0004 (500542) (Marine Hydraulics)

MARP 0005 (500543) (Small Diesel Repair and Maintenance)

FITE 0005 (500547) (Ropework)

SFTY 0001 (500545) (Basic Boat Skills)

SFTY 0005 (500546) (Vessel Maintenance)

SFTY 0001 (500545) (Basic Boat Skills)

FITE 0005 (500547) (Ropework)

**Electives (Salmonid) — Complete 6 courses**

500526 (Salmonid Health and Biosecurity)

This is an introductory course focused on the identification and treatment of common salmonid diseases and related biosecurity procedures. It includes the monitoring of fish health, proper biosecurity procedures, recognizing and reporting possible disease concerns, undertaking standard disease prevention measures, and safe pathogen handling and reporting procedures.

500539 (Aquaculture Work Experience)

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/pen containment systems for salmonids. It will include information on types of cage design, the function of the cage components, 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 stress 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/juvlenne 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 is designed to give workers/participants a basic level of knowledge and the necessary skills to maintain a variety of outboard motors (two and four stroke).

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 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’ Boat Camp survival.
**TECHNICAL CERTIFICATE - AQUACULTURE (SALMONID)**

500544 (Vessel Maintenance)
This course will be designed to give workers/participants a working knowledge of small vessel preventative maintenance and repairs.

500541 (Farm-Based Quality Certification)
This course will be developed to provide the participants with an overview of quality assurance and certification processes that may impact a farm's operational procedures and ultimately the marketing of its products.

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 is an awareness-level course that will provide participants with basic knowledge in oil spill response.

**TECHNICAL CERTIFICATE - BRIDGE WATCH PROGRAM**

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.

**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

**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

**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 but who wish 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.
**TECHNICAL CERTIFICATE - BRIDGE WATCH PROGRAM**

**PROGRAM OUTLINE**

CMSK 0103 (Communication Skills)
MATH 0103 (Mathematics)
NASC 0101 (General Ship Knowledge I)
SFTY 1102 (Marine Basic First Aid (STCW A-VI/1-3))
SFTY 11104 (WHMIS)
SFTY 1114 (Basic Safety - STCW V1)

Technical Session

SFTY 1117 (Survival Craft - STCW V12)
SFTY 1123 (Oil and Chemical Tanker Familiarization STCW’95 A-V1)
SFTY 1124 (Confined Space Entry Awareness) - To be delivered after SFTY 1123
SFTY 1127 (Passenger Safety Management)
SFTY 1129 (Security Awareness Training for Seafarers with Designated Security Duties)

**Work Term**

WKTM 0010 (Work Term - Bridge Watch Program)

Students who are placed in a sea-based work term, must complete a minimum of 60 Transport Canada approved calendar days as a bridge watch trainee signed onboard a ship. They must have documented Transport Canada testimonials of sea service and must complete the Bridge Watch Program training book. Successful completion of the training book along with a satisfactory employee evaluation will qualify for graduate eligibility and to challenge the Transport Canada Bridge Watch Program. 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 (This included CORE components)
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)
1. 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 requirement 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.

**TECHNICAL CERTIFICATE - FIRE RESCUE**

**PROGRAM OUTLINE**

FIRE 0006 (Hazardous Materials Awareness)
FIRE 0035 (Hazardous Materials Operations)
SFTY 11104 (Workplace Hazardous Materials Information Systems)

**Semester Two:**

FIRE 0011 (Fire Fighter - Level I)
FIRE 0040 (Flashover Recognition)
FIRE 0026 - (Land Based Response to Shipboard Fires - Awareness Level)
FIRE 0030 (Fire Pumper/Driver Operator)
FIRE 0034 (Firefighter - Level II)

**Work Term**

WKTM 0010 (Work Term)

**WORK TERM 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 requirement 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.
This is a Technical Certificate level program designed to provide fish harvesters with the opportunity to improve their position and become a Master or Deck Officer on board fishing vessels. The program prepares candidates to pass the examination set by Transport Canada for Fishing Master Class IV as well as providing them with a practical skill set to assume enterprise head status. This program will provide harvesters with the courses required to obtain Level II certification with the Professional Fish Harvesters Certification Board.

**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. 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 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 and Marine Institute medicals from an approved physician are 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

**PROGRAM ENTRY**

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 may commence their studies in Term 2 of the program. (Refer to Admissions section of this Calendar for general information regarding Advanced Standing.)

**PROGRAM STRUCTURE**

This program is offered over a period of 21 weeks. The first session prepares students to complete Transport Canada examinations for Fishing Master - Fourth Class certification. The second session provides additional courses for completion of the Technical Certificate in Harvesting and for Level II certification with the Professional Fish Harvesters Certification Board.

**PROGRAM OUTLINE**

**TERM 1 - FISHING MASTER IV**

- Chartwork and Plotting _ Level 1 (C/P 1)
- Navigation Safety _ Level 1 (NS 1)
- General Seamanship (Orals) (FM4-0)
- Simulated Electronic Navigation _ Limited (SENL)
- Ship Construction and Stability _ Level 1 (SCB-1)
- Radio Operator’s Certificate - Maritime Commercial (ROC MC)
- SFTY 1106 (Marine Advanced First Aid)
- SFTY 1108 (Marine Emergency Duties A1 - Basic Safety (MED A1))

**TERM 2 - ADDITIONAL COURSES**

- FITE 0001 (Introduction to Fishing Gear Construction and Repair)
- FRMG 0001 (Fisheries Resource Management)
- QLAS 0001 (Handling and Holding of Fish and Shellfish)
- MARP 0001 (Fishing Vessel Hull Repair and Maintenance - Fibreglass)
- MARP 0002 (General Fishing Vessel Maintenance)
- SFTY 1104 (WHMIS)
- BSMG 0002 (Introduction to Fishing Enterprise Management)

**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 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

**PROGRAM ENTRY**

Please refer to the Admissions section of this Calendar.
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 Cadet programs for deck and engineering students (diplomas of technology), the provision of recognized pre-sea instruction (technical certificates), giving instruction in the many courses that make up the various certificates issued by Transport Canada and, in some instances, acting as the examiner on behalf of Transport Canada.

PROGRAM ENTRY

The process for, and regulations governing, application for admission to Transport Canada Certification Programs falls under Application for Admission to Non-Degree Programs described in the section of this Calendar relating to Admission to the Marine Institute. Please refer to that section for details on how to apply for admission.

All Transport Canada courses offered by the Marine Institute lead the candidate to apply for Transport Canada certificates of competency. To attain a Transport Canada certificate of competency the candidate requires practical experience either at sea (Deck Certificates) or shop/shipyard/sea time (Engineering Certificates). For the periods of time required for each certificate of competency the applicant is referred to the Marine Personnel Regulations found at http://laws.justice.gc.ca/eng/regulations/SOR-2007-115 and the Transport Canada document TP2293E (The Examination and Certification of Seafarers) available at the nearest Transport Canada office, on the Transport Canada web site at http://www.tc.gc.ca/publications/en/tc2293/pdf/hr/p2293e.pdf or libraries in which government documents are found.

Transport Canada will normally assess practical experience to determine the appropriate level of certificate a candidate for certification is qualified to attempt. It is the applicant’s responsibility to ensure he or she is familiar with Transport Canada’s eligibility requirements, listed under TP2293E, prior to seeking certification with Transport Canada.

All seafarers must meet certain minimum medical standards before they will receive any certificate of competency issued by Transport Canada. The medical certificate is described in the

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 Publications, 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 cadet programs for deck and engineering students (diplomas of technology), the provision of recognized pre-sea instruction (technical certificates), giving instruction in the many courses that make up the various certificates issued by Transport Canada and, in some instances, acting as the examiner on behalf of Transport Canada.

NOTE

The issuance of certificates of competency by Transport Canada is only available to Canadian Citizens and persons with Canadian Landed Immigrant Status. Students should verify their eligibility status with Transport Canada before enrolling in either Transport Canada preparatory or accredited courses.

The Marine Institute offers a number of courses through its School of Maritime Studies to prepare individuals for Transport Canada Certification examinations as deck officers and marine engineering officers. These courses are offered throughout the year and are organized by the various certificates as programs. 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 certificate 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.

Information on courses for which the Marine Institute is authorized to conduct exams on behalf of Transport Canada, as well as courses available by distance, is available from the Registrar’s Office.
The Transport Canada Deck Officer Certification Preparation Program is delivered over four, seven week periods scheduled consecutively throughout the academic year. Each period is referred to as a “Block”. SEN and STCW Safety Training programs are offered throughout the year on an "as required" basis.

Courses for the Transport Canada Engineering Officer Certification Preparation Programs are scheduled during the year.

Please contact the Office of the Registrar for a copy of the schedules in place for the current Academic Year for the Deck Officer / Engineering Officer Certification Preparation courses for the respective Certificates of Competency. The Marine Institute reserves the right to cancel any course due to insufficient enrollment.

**TUITION AND OTHER FEES**

**Tuition**
All students enrolled in Transport Canada Certification Preparation Programs are subject to the Marine Institute’s Fees Payment Policy and are required to pay Marine Institute Student Union and Health Plan fees. Further details are provided in the Fees and Fees Payment information included in this Calendar.

Components for the Deck Officer Certification Preparation Programs are offered in Block I and Block II of the Fall Semester and Block III and Block IV of the Winter Semester. Any student attending two consecutive blocks in a given semester, will choose the components they wish to complete during the semester and pay all applicable fees upon registration in Block I and Block III respectively. Students who will be attending in Block II, or Block IV only, will be required to register at the beginning of that Block.

Students registering for Engineering Officer Certification Preparation programs are required to register and pay all fees on the first day of each course offering. Tuition fees for Engineering Officer Certification Preparation courses are set on a per course basis, not on the number of weeks allotted for each course.

All fees are subject to change.

**Confirmation Fees**
Students who plan to enroll in a combination of courses which includes any of the following simulation or practical courses are required to pay a Confirmation Fee for each course

- Simulated Electronic Navigation (SEN) I
- Simulated Electronic Navigation (SEN) II
- Propulsion Plant Simulation Level I
- Propulsion Plant Simulation Level II
- Global Maritime Distress and Safety Systems (GMDSS)
- Marine Emergency Duties (MED)
- Marine First Aid
- ECDIS

This fee is in addition to the Confirmation Fee required for the particular Block or course in which the student has been admitted. Upon registration in these courses, the Confirmation Fee is credited towards the student’s tuition charges and the tuition fees owing are thereby reduced by that amount.

**Refunds**
Upon formal withdrawal from the Marine Institute or through Drop/Add procedures, a student may be eligible for a refund or credit towards tuition for the next scheduled course. This process must be carried out using the Marine Institute’s Transport Canada Registration form.

The following is an excerpt from the Marine Institute Fees Payment Policy and relates to tuition payments for **Less than Full Semester Courses**; “please refer to the Marine Institute Fees Payment and Refund Policy as described under Fees and Financial Information”.

**Student Fees Refund Policy**

<table>
<thead>
<tr>
<th>Less than full semester programs:</th>
<th>Refund</th>
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<tbody>
<tr>
<td>In the first 5 days of classes</td>
<td>100%</td>
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<tr>
<td>6 class days to 8 class days</td>
<td>50%</td>
</tr>
<tr>
<td>9 class days to 11 class days</td>
<td>25%</td>
</tr>
<tr>
<td>12 class days and beyond</td>
<td>No refund</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Full semester programs:</th>
<th>Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the first 11 days of classes</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>
</tbody>
</table>

**NOTE**
No refund for programs 3 weeks or less.
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 (OHS), 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; 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
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 Fleshe 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 Molluscs 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 - 2 hours once per week = 26 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 finfish.
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
AQUA 4106 (Practical Aquaculture, Part I - (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 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

Lectures/Field Work - 13 weeks

AQUA 4107 (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.

Cod Farming; Rainbow Trout; Salmon Farming; Other Marine Finfish; 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 of the 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

Lectures - 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

Lectures - 4 hours per week = 52 total hours

Laboratories - 2 hours every second week = 12 total hours

AQUA 4141 (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 - 13 weeks

Laboratory - 3 hours once per week = 39 total hours

BIOI 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 - BIOI 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

BIOI 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 - BIOI 1100 (Biology)

Lectures - 39 hours

Laboratories - 39 hours

BIOI 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 - BIOI 1100 (Biology)

Duration - 13 weeks

Lectures - 3 hours/week = 39 hours total

Laboratories - 3 hours/week = 39 hours total

BIOI 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 - BIOI 1100 (Biology)

Duration - 13 weeks

Lectures - 3 hours/week

Laboratories - 3 hours/week
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; Food Borne Diseases; Microbiological Analysis of Foods; Shelf-life and Challenge Studies; Beneficial Uses of Microorganisms in Foods.

**Prerequisite** - BIOL 2102 (Microbiology) or BIOL 2105 (Microbiology)

**Duration** - 3 hours/week = 39 total 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

**Lecture** - 3 hours/week = 39 total hours

**Laboratory** - 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)**
The 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 Aerobols and Biofilters 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 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 2002 (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** - MREK 0101 (Marine Engineering Knowledge)

**Duration** - 13 weeks

**Lectures** - 2 hours/week

**BSMG 3030 (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 total hours

**BSMG 1100 (Law and Environment)**
This is the first of two advanced level courses designed to bring together the major aspects 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 Law and its Purposes; Marine Insurance; Salvage

**Prerequisites** - WCTM 1102 (Sea Phase 1 - 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** - 13 weeks

**Lectures** - 2 hours/week
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.
Introduction to the Shipyard: Framework of the Company; The Basic Work Pattern; Tendering; Design Check and Cost Estimating; Government Agencies and Ships; Specification Writing; Ship Contracts; Liability; Shipyard Planning Department; Quality Control; Union Contracts Sub Contractor Agreement
Prerequisite - ENSY 3301 (Ship Engineering Project) or NARC 3102 (Ship Design)
Duration - 6 weeks
Lectures - 6 hours per week = 30 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 Marine 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 maritime 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); WKTM 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 - WKTM 1102 (Sea Phase I - Nautical Science); Duration - 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 Recalls; Provincial Legislation; International Food Organizations
Lecture - 39 hours

BSMG 3118 (Technical Problem Solving)
This course is designed to give participants 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; Business Functions; Improving Productivity; Practicing Interpersonal Skills; Leadership Skills; Problem-Solving; Making Decisions and Taking Action; Contemporary Management Issues
Duration - 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; Environmental Economics; 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 total

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 AI 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 3202 (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 multi-ethnic 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; Women at Sea; Marine Occupational Health and Safety in Canada; Accident/incident Investigation Practices at Sea
Prerequisites - BSMG 3116 (Ship Management); WKTM 2102 (Sea Phase II - Nautical Science)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
COURSE DESCRIPTIONS

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

Prerequisite - NASC 1204 (Seamanship II); WKT M2102 (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 Personnel Management; Canada Labour Code

Prerequisite - BSMG 3104 (Ship Management); BSMG 3110 (Ship Management)

Duration - 20 hours over 7 weeks
Lectures - 15 hours over 7 weeks
Laboratories - 5 hours over 7 weeks

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

BSMG 4012 (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 (DU) - 13 weeks
Lectures (LC) - 3 hours per week = 39 hours total

BSMG 4013 (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 4014 (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 (DU) - 13 weeks
Lectures (LC) - 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 interest 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 Practices

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, Instruments and Institutions; Coastal 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

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 player.

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.
Prerequisites: 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 to electron and proton transfer reactions. These processes will provide the basis for applications in various technologies.
Prerequisites: 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 to electron and proton transfer reactions. These processes will provide the basis for applications in various technologies.
Prerequisite - CHEM 1101 (Chemistry) or equivalent
Duration: 13 weeks
Lectures: 3 hours/week
Laboratories: 3 hours/week = 39 hours total

CHEM 2010 (General Chemistry II)
This is an intermediate level course designed to provide the student with a detailed understanding of food analysis and how it relates to food chemistry and food technology.
Introduction to Food Chemistry; Reporting Results and Safety.
Prerequisites: PHYS 1200 (Physics); CHEM 2102 (Biological Chemistry) or CHEM 3102 (Biochemistry)
Lectures: 3 hours/week
Laboratories: 9 hours

CHEM 2101 (Biological Chemistry)
This course is designed to provide the student with a detailed understanding of food analysis and how it relates to food chemistry and food technology.
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; Protein and Amino Acid Metabolism.
Prerequisites: PHYS 1200 (Physics); CHEM 2102 (Biological Chemistry) or CHEM 3102 (Biochemistry)
Lectures: 3 hours/week
Laboratories: 39 hours

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 2001 (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 is an advanced level course designed to provide the student with an understanding of the various aspects of food chemistry.
Introduction to Food Chemistry; Water; Carbohydrates; Lipids; Amino Acids; Peptides, and Proteins; Vitamins and Minerals; Food Additives; Toxic Substances; Pigments and Colourants; Characteristics of Edible Muscle Tissues
Prerequisites: FDTE 2105 (Nutrition); 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 the student with a detailed understanding of food analysis and how it relates to food chemistry and food technology.
Methods; Quantitative Optical Spectroscopic Methods; Mass Spectroscopy
Prerequisites: PHYS 1200 (Physics); CHEM 2102 (Biological Chemistry) or CHEM 3102 (Biochemistry)
Lectures: 39 hours
Laboratories: 9 hours

CHEM 3200 (Physical Chemistry)
This theory-based course builds upon topics covered in CHEM 1101 (General Chemistry I) and CHEM 1201 (General Chemistry II).
Prerequisites: CHEM 1100 (Chemistry) or CHEM 1101 (General Chemistry I), CHEM 1200 (Chemistry) or CHEM 1201 (General Chemistry II), MATH 1101 (Calculus)
Duration: 13 weeks
Lecture: 3 hours/week = 39 total hours
Problem Solving Tutorial: 1 hour/week = 13 total 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 Solutes; 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 whilst introducing a student to chemical concepts related to food safety.
Introduction to Food Chemistry; Reporting Results and Reliability of Chemical Instrumentation; Naturally Occurring Food Components; Chemical Additives
Lectures: 39 total hours
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
Prerequisites: CHEM 4100 (Water Chemistry)
Duration: 13 weeks
Lecture: 3 hours/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 - 3 hours/week
CMSK 0203 (Communication Skills)
This course is designed to provide students with the various skills needed to communicate more 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 - 6 weeks
Lectures - 3/0
CMSK 1100 (Introduction to Technical Reporting)
This course is designed to teach technology students the fundamentals of technical communication in both oral and written forms. Emphasis is on strategies of technical writing and presenting.
Communication Process; Technical Writing Fundamentals; Technical Abstracts; Technical Descriptions; Technical Presentations
Duration - 13 weeks
Lectures - 4 hours/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 total hours
CMSK 1102 (Technical Communication I)
This course is designed to provide 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 Processes; Job Search
Duration - 13 weeks
Lectures - 4 hours/week
CMSK 1103 (Introduction to Technical Communications and Computer Applications)
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 reading, research gathering and analysis, and the strategies for technical reporting and presenting.
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 hour/week
CMSK 1104 (Introduction to Technical Reporting)
This course is designed 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 reading, research gathering and analysis, and the strategies for technical reporting and presenting.
Duration - 13 weeks
Lectures - 4 hours per week = 52 total hours
CMSK 1200 (Technical Reporting)
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.
Technical Reporting Strategies; Informal Report Writing; Formal Report Writing; Technical Presentations; Technical Correspondence
Prerequisite - CMSK 1100 (Introduction to Technical Communication)
Duration - 13 weeks
Lectures - 3 hours/week x 13 weeks = 39 hours total
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.
Prerequisites - CMSK 1102 (Technical Communications I)
Duration - 13 weeks
Lectures - 4 hours/week
CMSK 1202 (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.
Prerequisites - CMSK 1102 (Technical Communications I)
Duration - 13 weeks
Lectures - 4 hours/week
CMSK 1203 (Technical Reporting)
This course is designed to provide 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 total hours
CMSK 1204 (Technical Correspondence)
This course is designed to provide 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 total hours
CMSK 1205 (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.
Prerequisite - CMSK 1102 (Technical Communications I) or CMSK 1105 (Technical Communications I)
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
CMSK 2102 (Interpersonal Communications)
The goal of this course is 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 - 8 weeks
Lectures - 3 hours/week
CMSK 2201 (Technical Communications IV)
This course is designed to help students design 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 1201 (Communication at Work)
Duration - 8 weeks
Lectures - 3 hours/week
CMSK 4102 (Communication Skills)
This course is designed to provide students with effective communication skills and practices to apply in their future workplace and communities, and with direct application to other advanced diploma program modules. Emphasis will be on presentation skills, team building and group dynamics, and with direct application to other advanced diploma program modules.
Prerequisite - CMSK 2101 (Technical Communications III)
Duration - 13 weeks
Lectures - 2 hours/week = 26 hours
Seminar - 2 hours/week = 26 hours
CMSK 4201 (Technical Communications)
This course is designed to provide students with effective communication skills and practices to apply in their future workplace and communities, and with direct application to other advanced diploma program modules. Emphasis will be on presentation skills, team building and group dynamics, and with direct application to other advanced diploma program modules.

COURSE DESCRIPTIONS

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

Pre-requisite - 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

OR

Lectures - 7 hours/week
Laboratories - 4 hours/week

CNTL 20105 (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)
This course is designed as an introduction to thyristors and basic control theory, to provide the student with Final Control Elements and operation of Silicon Controlled Rectifiers, common breakerover 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 - ELTR 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 - 3 hours/week x 5 weeks = 15 hours total
Laboratories - 4 hours/week x 5 weeks = 20 hours total

CNTL 21111 (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 x 13 weeks = 39 hours total
Laboratories - 2 hours/week x 13 weeks = 26 hours total

CNTL 2201 (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.

Prerequisites - ELTK 1303 (Electrotechnology)
Duration - 13 weeks
Lectures - 3 hours/week x 13 weeks = 39 hours total
Laboratories - 4 hours/week every second week x 6 weeks = 24 hours total

CNTL 2202 (Instrumentation, Controls and Automation)
This is an introduction to process control systems, designed to provide the students with the concept of PID control as well as an overview of 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 x 13 weeks = 39 hours total
Laboratories - 2 hours/week x 26 weeks = 52 hours total

CNTL 2203 (Controls)
This course is intended to show the application of classical control theory to industrial control systems, including Bode Analysis. Control system components will be studied in theory and in the laboratory.

Modes of Control; Measurement Devices; Operational Amplifier Circuits; Bode Analysis

Prerequisite - CNTL 2108 (Control Devices & Basic Control Theory) or CNTL 2109 (Control Devices)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

CNTL 2204 (Control Devices & Basic Control Theory)
This is an introduction to process instrumentation and control systems, designed to provide the students with the basics of measurement, final control elements and advanced control systems.

Review of Process Control; Pressure Measurement; Signal Transmission; Level Measurement; Flow Measurement; Final Control Elements; Advanced Control Techniques

Prerequisite - CNTL 2108 (Control Devices & Basic Control Theory) or CNTL 2109 (Control Devices)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

CNTL 2205 (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

Prerequisites - CNTL 2110 (Instrumentation, Control and Automation)
Duration - 13 weeks
Lectures - 3 hours/week x 13 weeks = 39 hours total
Laboratories - 4 hours/week x 10 labs = 40 hours total

CNTL 2302 (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; Final Control Elements; Analysis Instrumentation

Prerequisites - CNTL 2206 (Instrumentation, Controls and Automation)
Duration - 13 weeks
Lectures - 3 hours/week x 13 weeks = 39 hours total
Laboratories - 4 hours/week x 10 labs = 40 hours total

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 or more advanced systems.

PID Control; Advanced Control Techniques; Digital Control Systems; Final Control Elements; Analysis Instrumentation

Prerequisites - CNTL 2208 (Programmable Logic Controllers – PLCs)
Duration - 13 weeks
Lectures - 3 hours/week x 13 weeks = 39 hours total
Laboratories - 4 hours/week x 10 labs = 40 hours total

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 acquire and develop troubleshooting skills through practical laboratory exercises. The course is designed for the student with the background in Programmable Logic Controllers (PLCs).

Program Control; Bit Manipulation; Sequencers; Analog Operations; PID Control; Human Machine Interface (HMI); AND Frequency Drives

Prerequisite - CNTL 2207 (Programmable Logic Controllers – PLCs)
COURSE DESCRIPTIONS

Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total
Laboratories - 3 hours once per week for 10 weeks = 30 hours total

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, and oil and gas sectors.

Prerequisites - CNTL 3101 (Instrumentation, Controls and Automation)
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total
Laboratories - 2 hours once per week = 26 hours total

CPSK 0100 (Introduction to Computers)
This course is designed to introduce students to computer systems. Particular emphasis is placed on the use of word processing, spreadsheets, e-mail and the internet and security issues.

Computer Fundamentals; Word-processing Software Applications; Spreadsheet Software Applications; Electronic Research.
Prerequisite - None
Duration - 13 weeks
Lectures/Laboratories - 2 hours/week + 26 hours total (G2)

CPSK 1100 (Computer Applications)
This course is designed to introduce students to the use of computers as communication and learning tools.

Computer Fundamentals; Work-processing Software Application; Electronic Research and Communication; Presentation Software Applications; Spreadsheet Software Applications
Duration - 13 weeks
Lectures/Laboratories - 5 hours/week

CPSK 1101 (Computer Operations)
This course is designed to introduce the student to the various personal computer operating systems including MS DOS 6.2, Red Hat Linux, and Windows 2000.

Introduction to Operating Systems; Introduction to Linux; Introduction to Windows 2000
Duration - 13 weeks
Lectures/Lab - 0.4 hours/week

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#.

Computer Fundamentals; Program Design; C++;/C# Fundamentals; Expressions and Interactivity; Decision Statements; Looping Statements; Functions; Arrays; Advanced File Operations; Pointers.
Duration - 13 Weeks
Laboratories - 2 hours twice per week = 52 total hours

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.

Computer Fundamentals; Presentation and Word-processing Software Applications; Intermediate and Advanced Spreadsheet Software Applications; Database Software Applications; Software Integration
Prerequisite - None
Duration - 13 weeks (65 hours total)
Lectures - 1 hour/week
Laboratories - 4 hours/week (two 2-hour labs/week)

CPSK 1300 (Computer Skills)
This course is designed to introduce students to the use of computers as communication and learning tools.

Computer Fundamentals; Word-processing Software Applications; Electronic Research and Communication; Presentation Software Applications; Spreadsheet Software Applications
Prerequisite - None
Duration - 5 weeks
Lectures - 0 hours/week = 0 hours total
Laboratories - 8 hours/week = 40 hours total

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.

Web Page Design; Advanced Spreadsheet Software Applications; Database Software Applications; Software Integration
Prerequisite - CPSK 1100 (Computer Applications)
Duration - 13 weeks
Lectures - 5 hours/week

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, parallel a.c. and d.c. motors 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
Prerequisite - ELTK 0102 (Electrotechnology) or equivalent
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 2 hours/week (1 Lab every two weeks)

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.

Introduction to Electricity; Ohm’s Law and Electric Circuits; Network Theory; Magnetism and Electromagnetism; Electrical Measurement; Inductance; Cells and Batteries
Prerequisite - None
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total
Laboratories - 2 hours/week = 26 hours total

ELTK 1101 (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 1102 (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
Prerequisite - ELTK 1100 (Electrotechnology) or ELTK 1102 (Electrotechnology)
Duration - 13 weeks
Lectures - 4 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 in A.C. Circuits; Capacitance and Its Effect in A.C. Circuits; Resonance; Introduction to Transformers; Introduction to Polyphase A.C.
Prerequisite - ELTK 1100 (Electrotechnology) or ELTK 1102 (Electrotechnology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

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.
**COURSE DESCRIPTIONS**

**Prerequisite - ELTK 1101 (Electrotechnology)**
Duration - 13 weeks
Lectures - 5 hours/week
Laboratories - 2 hours/week

**ELTK 1202 (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 in A.C. Circuits; Capacitance and its Effect in A.C. Circuits; Resonance; Introduction to Transformers; Introduction to Polyphase A.C.

**Prerequisite - ELTK 1102 (Electrotechnology)**
Duration - 13 weeks
Lectures - 3 hours/week = 39 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, magnetism, resistance, capacitance, inductance, motors, generators, transformers, and protective devices. The laboratory work is designed to develop skills in the construction of basic electrical circuits and the use of electrical measuring instruments. It will also reinforce theoretical concepts.

Electrical Principles; Electric Circuits; Electrical Safety; Magnetism; Inductance; Cells and Batteries; A.C. Theory; Inductance in A.C. Circuits; Capacitance in A.C. Circuits; and Distribution and Protection Devices

Duration - 13 weeks
Lectures - 4 hours/week = 52 hours total
Laboratories - 2 hours/week = 26 hours total

**ELTK 1301 (Electrotechnology)**
This is a basic electrotechnology course designed to give the Marine Engineering student practical electrical experience.

Marine Safety; Marine Cabling and Glazing; Fuses and Breakers; Single and Three Phase Wiring; Multi-Meters and Meggals; Batteries; Electrical Panels; Gauges and Sensors; Starting Motors and Alternators; A.C. and D.C. Motors and Generators; Internal Communications

**Prerequisite - ELTK 1100 (Electrotechnology)**
Duration - 5 weeks
Lectures - 2 hours/week
Laboratories - 6 hours/week (2 labs - 3 hours each)

**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 electric systems and machines. As well, the structure and protection of marine power systems is covered.

DC Machines; AC Machines; Marine Electrical Power Systems

**Prerequisite - ELTK 1103 (Introduction to Electrotechnology Applications) OR ELTK 1200 (Electrotechnology)**
Duration - 5 weeks
Lectures - 8 hours/week = 40 hours total
Labs - 4 hours/week = 20 hours total

**ELTK 2012 (Electrotechnology)**
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
Laboratories - 2 hours/week = 39 total hours
Laboratories - 2 hours once per week for 10 weeks (starting in week 2) = 20 hours total

**ELTK 2012 (Marine Electric Systems)**
This is an introductory course in ship electrical systems. This course requires students to apply structured problem-solving strategies to identify and resolve problems with ROV electrical systems.

Cables and Connectors; Transformers; Special Transformers; DC Machine Construction; DC Generators; DC Motors; Single-Phase Transformers; Special Transformers

**Prerequisite - ELTK 1201 (Electrotechnology) OR ELTK 1200 (Electrotechnology)**
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 2 hours/week

**ELTK 2010 (Electrotechnology)**
This is an introductory 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 20104 (Electrotechnology)**
This is an introductory course in ship electrical systems. Ship Electrical System; Small Ship System; Large Ship System Distribution and Protection Devices

**Prerequisite - ELTK 1200 (Electrotechnology)**
Duration - 5 weeks
Lectures - 2 hours/week

**ELTK 2006 (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 rotating machinery and an idea of the type and operating characteristics of various DC machines. 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; Synchronormechanisms and Servomechanisms; Final Correcting Devices and Amplifiers; Input Transformers - 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 2108 (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 Electrical-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 Glazing; Single and Three-phase Wiring; Distribution Schemes; Earthy Ground Fault Detection Systems; Batteries; Motors and Generators; Internal Communications

**Prerequisite - ELTK 1100 (Electrotechnology) or equivalent**
Duration - 13 weeks
Lectures - 2 hours/week
Laboratory - 3 hours/day

**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.

Electrical Safety; Meters and Meggers; Fuses and Molded Case Circuit Breakers; Single and Three Phase Wiring; Introduction to Generators and Motors; DC Generators and DC Motors; AC Generators (Alternators) and AC Motors; Control Devices; Distribution Systems

**Prerequisites**
- ELTK 1202 (Electrotechnology)
- 13 weeks
Lectures - 4 hours/week = 52 total hours
Laboratories - 2 hours/week = 26 total hours

**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 systems.

Meters and Meggers plus Instrumentation; Electrical Panels; Control Devices; Protection Equipment; Marine Cabling and Glazing; Single and Three-phase Wiring; Motors and Generators (ROV, AC in particular); Structured Problem Solving; Power Supplies; Tracking Analog Signals

**Prerequisites**
- ELTK 1303 (Electrical Machines and Power Systems)
- 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 3 hours once per week = 39 total hours

**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 systems.

Battery Systems and Electrolysis; Electric Motors and Alternators; Marine Electrical Equipment, Wires, Cables and Glands; Function Tests; Starters and Controllers; Electrical Panels

**Prerequisites**
- ELTK 2119 (Marine Electrical Systems)
- 5 weeks
Lectures - 0 hours/week = 0 hours
Laboratory - 8 hours/week = 40 hours total
ELTK 3101 (Electrotechnology)
This is an advanced level course which covers topics in AC machines. The course is designed to provide the student with the necessary background information concerning the types 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

Prerequisite - ELTK 2106 (Electrotechnology) or equivalent
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ELTK 3102 (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 Machine Construction; DC Generators; DC Motors; Single-phase Transformers; Three-phase Transformers; Special Transformers

Prerequisite - ELTK 1210 (Electrotechnology); ELTK 2111 (Marine Electrical Equipment)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

ELTK 3103 (Rotating AC Machines)
This is an advanced level course designed to provide the student with the necessary background concerning the types, characteristics, and applications of AC machines common to the marine environment.

Three-Phase Induction Motors; Three-phase Synchronous Motors; Motor Branch Circuits and Enclosures; Alternators; Single-phase AC Motors

Prerequisite - ELTK 1200 (Electrotechnology); ELTK 2119 (Marine Electrical Equipment)
Duration - 13 weeks instruction
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

ELTK 3300 (Marine Electrical Knowledge)
This electrotechnology course is designed to give the Ocean Technology student a basic understanding of marine electrical systems.

Metering; Electrical Maintenance; Electrical Panels; Protection Equipment; Backup Power Supplies; Auxiliary Electrical Systems; Internal Communications

Prerequisite - CNTL 2111 (AC Motor Controls)
Duration - 5 weeks
Lectures - 7 hours/week

ELTK 3301 (Marine Electrical Safety & Standards)
The purpose of this course is to provide the student with an exposure and basic understanding of electrical safety and standards pertaining to the installation and maintenance of electrical equipment in the marine industry.

Introduction to Safety and Standards; Grounding and Bonding; Conductor Ampacity and Marine Cables; Power Distribution and Panels; Ship Electrical Equipment; Marine Electrical Safety.

Prerequisites - CNTL 2111 (AC Motor Controls)
Duration - 5 weeks
Lectures - 7 hours/week
Laboratories - 2 hours/week = 39 hours total
Laboratories - 2 hours/week x 11 weeks = 22 hours total

ELTK 3500 (Marine Cabling Installations)
This course is intended to provide the student with the knowledge and skills necessary to select, install, and terminate cables for on deck subsea installations in a marine environment. It will involve application considerations for construction and selection of marine cables and connections, on deck electrical installations and hazardous area considerations, and sonar, data collection and Remote Operated Vehicle considerations.

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 - ELTK 2113 (Fiber Optics)
Duration - 5 weeks
Lectures - 4 hours/week = 20 hours total
Laboratories - 4 hours twice a week = 40 hours total

ELTK 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 coursework in marine engineering process control and instrumentation.

Semiconductor Devices; Integrated Circuits; Transistor Switching Circuits, and Microprocessors/Computers/PLCs as Control Devices

Prerequisite - ELTK 1100 (Electrotechnology); ELTK 1200 (Electrotechnology)
Duration - 13 weeks
Lectures - 9 hours/week
Laboratories - 2 hours/week

ELTK 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 - Electromechanical 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; Computer Aided Design; Connectors; Schematic Diagrams and Component Identification; Care and Use of Basic Test Equipment

Prerequisite - for Bachelor of Technology (Ocean Instrumentation) students: ELTK 1200 (Electrotechnology)
Co-requisite - for Electro-mechanical Technician and Electronics Engineering Technician students: ELTK 1101 (Electrotechnology)
Duration - 52 hours
Lectures - 13 hours
Laboratories - 29 hours

ELTR 1104 (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 - ELTR 1103 (Introduction to Electrical Technology)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week x 11 weeks = 22 hours total
COURSE DESCRIPTIONS

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; Programming Logic Arrays; Sequential Logic
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 1 lab @ 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
Prerequisite - ELTR 1102 (Basic Electronic Devices); ELTR 1103 (Electronic Fabrication Techniques)
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; Amplitude Modulation and AM Systems; Single-Sideband Techniques; Frequency and Phase Modulation; Matching Circuits; Noise
Co-requisites - ELTR 1102 (Basic Electronic Devices); MATH 1103 (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
Prerequisites - ELTR 1103 (Electronic Fabrication Techniques) OR ELTR 1104 (Electronic Fabrication Techniques)
Duration - 13 weeks
Lectures - 1 hour/week (13 hours total)
Laboratories - 2 hours once/week (26 hours total) OR Duration - 5 weeks
Lectures - 2 hours/week (10 hours total)
Laboratories - 3 hour lab twice/week (30 hours total)

ELTR 2114 (Electromagnetic Radiation)
This course is designed to give naval students basic knowledge of radiation hazards aboard 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; EM and EM Fields; Shipboard Antennas and Radar; Shipboard EM Sources; Shielding, and Protocols; Cables and Transmission Lines; Grounds and Bonds; Radiation Hazards; EME Inspections and Testing
Prerequisite - ELK 1101
Duration - 13 weeks
Lectures - 2 hours/week = 26 hours total
Laboratories - 1 hour/week + 13 hours total

ELTR 2115 (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 fiber 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.
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; Fiber Optics.
Prerequisite - ELTR 1103 (Introduction to Electrotechnology Applications) OR ELTR 1200 (Electrotechnology) or equivalent
Duration - 13 weeks
Lectures - 3 hours 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 Electrodic Drives in ROV
Prerequisites - 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 Microprocessors and Supporting Chips; Memory Systems; Input/Output and Communications; Shielding, Grounding and Transmission Line Techniques; Interfacing Basics and Special Applications (Laboratory Objective)
Prerequisite - ELTR 2102 (Digital Logic)
Duration - 13 weeks
Lectures - 4 hours/week
Laboratories - 3 hours/ week

ELTR 2118 (Introduction to Computers and Networking)
This course is an introduction to computer systems and networking.
Computer Systems; Network Environment; Network Routing; Network Management; Network Security
Prerequisite - CPKS 1102 (Introduction to Programming)
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours
Laboratories - 2 hours/ week = 26 hours

ELTR 2202 (Analogue Transistor Circuits)
This course involves the practical application of linear circuit theory to transistor 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.
Transistor DC Biasing; Small Signal Models; Small Signal Analysis; Multistage Amplifiers; Power Amplifiers; Frequency Response
Prerequisite - ELTR 1102 (Basic Electronic Devices) or ELTR 1301 (Introduction to Electronic Devices); ELTR 1200 (Electrotechnology) or ELTR 1103 (Introduction to Electrotechnology Applications)
Duration - 13 weeks
Lectures - 4 hours per week = 52 total hours
Laboratories - 3 hours once per week = 39 total hours

ELTR 2213 (Control Devices and Operational Amplifiers)
This course is designed as an introduction to the practical design of operational amplifiers. It will provide the student with the basic design and operation of Silicon Controlled Rectifiers, common breakover devices, other thyristors, 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 II)
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 Line Techniques; Interfacing Basics and Special Applications (Laboratory Objective)
Prerequisite - CPKS 1102 (Introduction to Applied Programming); ELTR 2102 (Digital Logic); ELTR 1303 (Electrical Machines and Power Systems); ELTR 1103 (Fabrication Techniques)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratories - 3 hours/week = 39 hours

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 (Analogue 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 - CNTL 2108 (Control Devices & Basic Control Theory) or CNTL 2109 (Control Devices); MATH 1103 (Introduction to Calculus)
Co-requisite - ELTR 2202 (Analogue Transistor Circuits)
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 as 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

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-sidedband techniques. Then the student is introduced to transmission mediums, protocols and characteristics. This is followed by digital communications 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.

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; Fibre Optics.

Prerequisites - for ROV students ELTR 1301 (Control Electronics for ROV); for ROV Advanced Technical Certificate students, ELTR 3110 (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 Controllers)
BTech(UV) students - ELTR 1301 (Introduction to Electronic Devices) and ELTR 1303 (Machines and Power Systems)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week (6 Labs) = 12 hours total

ELTR 3121 (Introduction to Microcomputer Interfacing)
This course provides the student with knowledge of the hardware associated with a microcomputer system and its basic interfacing requirements.

Microprocessor Systems; Memory Systems; Microprocessor System Support Circuits; Bus Structures, Digital Input/Output; Assembly Language Basics; C Language Basics; Interfacing Basics.

Prerequisites - ELTR 2102 (Digital Logic)
Duration - 13 weeks
Lectures - 3 hours/week = 52 hours total
Laboratories - 3 hours/week = 39 hours total

ELTR 3122 (Embedded Microcontrollers)
This course provides the student with knowledge of the hardware and software associated with Embedded Microcontrollers.

Introduction to Embedded Microcontrollers; Microcontroller Functions; Program Design & Interfacing; Programming Environments; Serial Data Communications; Data Conversion; Digital Signal Processing; Microcontroller Platforms

Prerequisites - ELTR 2215 (Microcomputer Interfacing)
Duration - 13 weeks
Lectures - 3 hours per week = 39 hours total
Laboratories - 2 hours once per week = 26 hours total
COURSE DESCRIPTIONS

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
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. Pentium Processors Features; Analog Input/Output; Embedded Systems; C++ Programming; Mixing Assembler and C++; Advanced Interfacing Design and Applications

Prerequisites - ELTR 3121 (Introduction to Microcomputer Interfacing)
Duration - 13 weeks
Lectures - 4 hours/week = 52 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. 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, power meters, as well as hands on practice with Ocean Sensor Systems.

Introduction to Analog Communications; Amplitude Modulation and FM 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 - 2 hours once per week = 26 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 the work place.

Purpose and Make-up of Blueprints; Basic Machine Shop and Engineering Knowledge to Select Tools and Materials and Make Working Assembly Drawings, Using Traditional Methods, of Selected Machine Machinery. Drawing diagram reading exercises are used to extract information as required in the workplace.

This introductory level course is designed to provide students with 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 workplace.

Prerequisite - ENGR 1105 (Engineering Drawing) or equivalent
Duration - 13 weeks
Lectures - 1 hour/week = 13 hours
Laboratories - 2 hours/week = 26 hours

ENGR 0204 (Template Development)

This introductory level course is designed to familiarize the student with practical aspects of template development.

Template Development; Layout and Template Development Terminology; Establishing Line of Cut Using Templates; Shape Development; Layout Tools and Procedures; Template Development Using Triangular, Radial and Parallel Lines; Layout Operation for Structural Fabrications; Operations Required to Develop Wrap Around Templates for Pipe and Tubing.

Prerequisite - ENGR 0107 (Blueprint Reading and Interpretation)
Duration - 13 weeks
Lectures - 3/0

ENGR 1100 (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.

Introduction to Technical Drawing; Geometric Constructions; Pictorial Sketching; Orthographic Projection; Scale; Blueprint Interpretation; Dimensioning; Sectional Views

Duration - 13 weeks
Lectures - 2 hours/week = 26 hrs total
Laboratories - 2 hours/week = 26 hrs total

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.

Prerequisite - ENGR 1105 (Engineering Graphics)
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 workplace.

Prerequisites - ENGR 1105 (Engineering Graphics)
Duration - 13 weeks
Lectures - 2 hours a week for a total of 26 hours
Laboratories - 2 hours a week for a total of 26 hours
Total - 52 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.

Introduction to Technical Drawing; Geometric Constructions; Pictorial Sketching; Orthographic Projection; Scale; Blueprint Interpretation; 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 1105 (Engineering Graphics)
Duration - 8 hours/week = 40 hours
ENGR 1105 (Engineering Graphics)
This Engineering Graphics course provides students with knowledge and skills pertaining to visually oriented data that is usable by technical, engineering, and manufacturing personnel to assist in the production of goods and services.
Introduction to Technical Drawing: Geometric Constructions; Pictorial Sketching; Orthographic Projection; Scale; Blueprint Interpretation; Dimensioning; Sectional Views
Duration - 13 weeks
Lectures - 2 hours/week = 26 hrs total
Laboratories - 2 hours/week = 26 hrs total

ENGR 1201 (Introduction to AutoCAD)
This is an introductory course designed to provide students with fundamental competency in the use of AutoCAD.
Introduction to CAD; Editing Existing Entities; Advanced Drawing Construction; Dimensioning Variables; Plotting
Prerequisites - ENGR 1103 (Engineering Graphics)
Duration - 13 weeks
Lectures - 0 hours/week = 0 hours total
Laboratories - 3 hours/week = 39 hours total

ENGR 1202 (ROV Drafting and Blueprints)
This course is designed to develop the skills necessary for the student to interpret working drawings and prints common to industry. This course will also develop the necessary skills to produce engineering drawings using AutoCAD (computer aided drafting).
Drafting Fundamentals; 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 various aspects of Marine Engineering Systems Design.
The Ship’s Environment; Ship Terminology; Hull Form; Pumps; Pumping and Piping Systems; Pipings 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 Costs; Package Documentation; Relationship of Auxiliary Systems to Vessel Type; Quality Control in Shipbuilding
Prerequisites - ENSY 1202 (Introduction to Marine Engineering Systems Design); CMSK 1201 (Communication at Work)
Duration - 5 weeks
Lectures - 6 hours/week = 30 hours total
Laboratories - 2 hours/week = 10 hours total

ENSY 2102 (Propulsion Technology)
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 Design and Arrangement; Propulsion Shafting Components Design and Selection; Propellers; Thrusters; Reduction Gears and Other Transmission Systems; Electric Propulsion Motors; Ship-Propulsion Vibration; Installation Procedures and Testing
Prerequisites - ENSY 1202 (Introduction to Marine Engineering Systems Design); NARC 1102 (Ship Structural Geometry)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

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 drawings 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 MESD); CMSK 1201 (Technical Communications 2)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/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 Gas Systems and Tdas; Turbine Hubs; 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.
Mechanical and Natural Ventilation: Ventilation Guidelines for Accommodations; Ventilation Guidelines for Control Rooms; Ventilation Guidelines for Machinery Spaces; Marine Ventilation Fans; Low and High Velocity Systems; Heating and Air Conditioning; Ventilation System Drafting

Prerequisite - ENSY 1202 (Introduction to Marine Engineering Systems Design); ENSY 2201 (Auxiliary Systems)
Duration - 5 weeks
Lectures - 6 hours/week
Laboratories - 4 hours/week

ENSY 3000 (Cold Environment Design)
This is a technical course structured to give students comprehensive information and detailed knowledge of how the cold environment of the Arctic and Sub-Arctic impact on the design of ship operating in these regions. In addition, the students will learn how the engineer must apply the lessons learned in the past and use innovative ideas and techniques to design ice operating ship propulsion systems, auxiliary systems and equipment that are actually working in the cold environment.

Ice and Environmental Conditions; Propulsion of Icebreaking Ships; Selection of Propulsion Systems; Propulsion Shafting for Icebreaking Ships; Ship Service, Controls, Instrumentation and Electric Requirements; Cooling Systems for Icebreaking Ships; Icebreaking, Ice Releasing and Roll Stabilization Systems; Steering and Augmentation to Maneuverability in Ice; Protective Measures against the Cold Environment; Cold Design Special Features

Prerequisites - ENSY 2102 (Propulsion Technology); ENSY 2201 (Power and Resistance Technology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ENSY 3102 (Propulsion Arrangement Design)
This course concentrates on the complete design and layout of ship propulsion systems. Students will learn to complete propulsion train drawings taking into account Shaft Diameters, Propellers, Bearings, Thrust Block, Couplings and Clutches capable of absorbing torsional and vibration forces.

Prerequisites - ENSY 2102 (Propulsion Technology); ENSY 2103 (Power and Resistance Technology)
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ENSY 3103 (Ship Stability for MESD)
This course introduces the fundamentals of hydrostatics, ship stability and damage stability. It aims to develop an understanding of stability theory, criteria for stability assessment, and applicable regulations. Loadline and tonnage regulations, trim and stability books and industry software are studied. Emphasis is placed on application of the theory as related to ship systems and tanks.

Basic Hydrostatics; Ship Mass and Center of Mass; Longitudinal Stability and Trim; Small Angle Stability; Large Angle Stability; Tank Calibrations; Free Surface; Subdivision; Damaged Stability; Rules and Regulations, Required Submissions, and Testing; Tonnage, Freeboard, and Downdrafting; Computer Applications

Prerequisite - NARC 1102 (Ship Structural Geometry); PHYS 1100 (Physics)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 2 hours/week = 26 hours total

ENSY 3104 (Applied MESD)
This course will demonstrate the practical application of fundamental topics of marine engineering previously introduced in the program, including Fluids, Strength of Materials and Thermodynamics. Engineering analysis will be applied to various marine systems as emphasis is placed on application of the course.

Applied Fluid Dynamics; Applied Strength of Materials; Applied Thermodynamics; Special Topics in Applied Marine Engineering Design
Prerequisites - FLDS 2100 (Fluid Mechanics); MATH 2101 (Advanced Calculus); TRMO 2200 (Thermodynamics); MTTR 3100 (Strength of Materials)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total
Laboratories - 1 hour/week = 13 hours total

ENSY 3105 (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; Integration of Systems; Presentation Methods; Final All Day Exam
Prerequisite - ENSY 3300 (Ship Engineering Project)
Duration - 13 weeks
Lectures - 1 hour/week
Laboratories - 4 hours/week

ENSY 3201 (Ship 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
Prerequisite - ELTK 2102 (Marine Electrical Systems)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 3 hours/week

ENSY 3202 (Marine Electrical Project)
This course is a continuation of ENSY 3101 and introduces the design of electrical systems for ships. It covers topics such as power distribution, electrical machinery, and control systems. The course also covers the design and selection of electrical equipment, including transformers, generators, and motors.

Prerequisite - ENSY 3101
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

ENSY 3300 (Piping Arrangement Design)
This is a technical course structured to give students the required skills to produce drawings of piping arrangements to be fitted within the irregular and confined space of a ship's machinery compartment. In addition students will learn how to select components, avoid interferences, minimize drafting time, produce a Bill of Material and perform final calculations. They will also acquire techniques to produce pipe spooling using modern methodologies.

Component Selection; Piping Arrangement Techniques; Piping Arrangement Layout; Development of Drawings; Pipe Spooling Techniques; Bill of Material and Drawing Components Identification; Velocity and Pressure Checks
Prerequisite - ENSY 2201 (Auxiliary Systems)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 3 hours/week

ENSY 3305 (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
Prerequisite - 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. Size, scope, function, 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 Control; Food Processing; Marketing and Product Development; Specialty Foods; Issues
Duration - 13 weeks
Lectures - 3 hours (3 hours/week)
Laboratories - 26 hours (2 hours/week)
COURSE DESCRIPTIONS

FDTE 2103 (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)
Lectures - 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)
Lectures - 39 hours

FDTE 2112 (Food Safety and Sanitation)
This course is designed to introduce students to the various aspects of sanitation and to provide students the necessary tools to design, and implement and effective sanitation program.
Sanitation Programs for Food Plants; 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 - 13 weeks instruction
Lectures - 2 hours/week = 26 hours total
Laboratories - 3 hours/week = 39 hours total

FDTE 2118 (Canned Foods & Thermal Processing)
This is an industry training course providing competencies relevant to thermal processing operations. Principles of HACCP require that personnel be appropriately trained for roles in food processing establishments. Acts and Regulations enforced by the Canadian Food Inspection Agency require control over food contamination. The Facilities Inspection Manual, stemming from the Food Inspection Regulations, requires that, "The designated person in control of the retrofit operations has successfully completed a recognized course in thermal processing and retort operation."
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)

FDTE 2201 (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
Laboratories - 3 hours/week

FDTE 2202 (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. Students are also provided with an overview of the role of the Canadian Food Inspection Agency (CFIA) in the production and processing of those 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)
Lectures - 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 Water Management in Food Industry; Biosensors for Biological Monitoring; Safety and Regulatory Issues of Biotechnology-derived Foods
Prerequisites - BIOL 2202 (Food Microbiology); CHEM 2102 (Biological Chemistry); FDTE 3107 (Food Processing II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

FDTE 3102 (Safe Food 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.
Introduction to Food Processing; Fresh Fruit and Vegetable Processing; Jams, Jellies and Fruit Spreads; Fruit Juice and Other Beverage Processing; Processing of Edible Fats and Oils of Plant Origin; Cereals, Grains and Starches; Soybean Technology; Sugars, Sweeteners and Confectionary Products; Food Hydrocolloids
Prerequisites - BIOL 2102 (Microbiology) or BIOL 2105 (Microbiology); FDTE 2103 (Food Engineering Principles); FDTE 2112 (Food Sanitation); FDTE 2202 (Food Processing I)
Co-requisites - CHEM 3100 (Chemistry)
Duration - 13 weeks
Lectures - 3 hours/week = 39 total hours
Laboratories - 3 hours once per week = 39 total hours

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, certification and maintenance 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 (FSSC 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 other 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 in Meat, Poultry and Fish; Fruit and Vegetables Industry; Dairy Industry
Duration - 39 hours total
Lectures - 39 hours total
This course is designed to provide general guidelines useful for a wide range of inspection activities for monitoring the safety and quality of foods.

Introduction: Food Sanitation and Chemicals; Chemicals in Foods; Hazards; Natural Chemical Agents: Additives; Nutritional Biohazards; Food Irradiation; Food Sensitivities; Food Processing; Nutritional Toxicants; Unnatural Chemical Agents: Accidental; Introduction; Chemical Toxicants in Food: an Overview; Naturally Occurring Toxins; Unnatural Chemical Agents: Accidental; Unnatural Chemical Agents: Additives; Nutritional Biohazards; Food Irradiation; Food Sensitivities; Food Processing; Nutritional Quality and Safety; Biological Agents.

Lectures - 3 weeks total
Laboratories - 39 hours total

FDTE 4014 (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.

Introduction: Chemical Toxins in Food; an Overview; Naturally Occurring Toxins; Unnatural Chemical Agents: Accidental; Unnatural Chemical Agents: Additives; Nutritional Biohazards; Food Irradiation; Food Sensitivities; Food Processing; Nutritional Quality and Safety; Biological Agents.

Laboratories - 39 hours total

FDTE 4105 (Food Safety & Hygiene)

This course is designed to provide students with an detailed information concerning sanitation and good hygiene practices. The course will enable students to set policies and design cost-effective programs.

Introduction: Regulations and Buyer Drive Programs Affecting Food Sanitation; Microbiology; The Control of Microorganisms; Cleaning and Sanitation Practices; Pest Control; Industry-Specific Sanitation Considerations; Elements of an Effective Sanitation Program; Facility Design, Maintenance and Construction.

Lectures - 13 weeks
Laboratories - 2 hours per week (26 total hours)

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.

Water Process Treatment Train; Wastewater Process Treatment Train

Duration - 7 weeks
Lectures - 2 hours/week
FIRE 0035 (Hazardous Materials Operations)

This is an introductory level course designed to enable students to identify dangerous goods incidents and to properly respond to hazardous materials situations under the guidelines of Hazardous Materials Operations.

Chemical Properties and Hazardous Materials Behaviour; Incident Management; Strategic Goals and Tactical Objectives; Terrorist Attacks, Criminal Activities and Disasters; Personal Protective Equipment (PPE), Decontamination; Product Control; Air Monitoring and Sampling; Victim Rescue and Recovery; Evidence Preservation and Sampling; Illicit Laboratories

Prerequisite - FIRE 0036 (Hazardous Materials Awareness)

NOTE: To be certified to the NFPA 472 - Hazardous Materials Operations Level, successful completion of NFPA 472 Hazardous Materials Awareness is required.

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 Rescue (Vehicle and Machinery Extrication Level I and II)

Level I:
Introduction to Vehicle and Machinery Extrication; Extrication Incident Management; Vehicle Anatomy and Science; Extrication Equipment; Extrication 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 Rescue (Rope Rescue Level I and II)

NOTE: For successful completion of NFPA 1006 Technical Rescue - 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 Rescue Courses (Rope Rescue, Confined Space and Vehicle Extrication) that will amount to another 10 days.

FIRE 0039M Technical Rescue (Confined Space Rescue Level I and II)

Level I and II:
This is a Technical Rescue 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 I:
Introduction to Confined Spaces; Confined Space Entry Requirements; Using the Incident Command System; Strategic Rescue Factors; Safety; Rescue Operations and Considerations; Air Monitoring; Ventilation and Inerting; Rescue Equipment; Team Evaluation

Level II:
Confined Spaces and Their Hazards; Confined Space Entry Requirements; Using the Incident Command System; Strategic Rescue Factors; Rescue Operations and Considerations; Air Monitoring; Ventilation and Inerting; Lookout / Tagout; Team Evaluation

Prerequisites - FIRE 0038M (Technical Rescue Level I and II)

NOTE: Certification in NFPA 1006 Confined Space Entry Level I must be successfully completed before receiving certification in NFPA 1006 Confined Space Entry Level II

Duration - 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 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 - 7 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 safety operation and handling of fishing vessels. It is essential that vessel operators have a good understanding of the relationships that exist between the vessel's structural 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 Ruling Laver Curves; Basic Longitudinal Stability Principles; Principles of Free Surface Effect, Freeboard 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 maximise the use of the computer at sea. This course includes distinct components of electronic navigation, managing fishing data, collision avoidance and communication.

The Windows®-Based 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; System Status Alarms and Indicators; Risk of Over-reliance; Fishing Data Management; Back-up Arrangements; Collision Avoidance Information Management; Bottom Mapping; Communications.
**FLDS 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, ducting 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)

**Duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 2 hours/week = 26 hours total

**FLDS 2106 (Introduction to Fluid Statics & Dynamics)**

This is an introductory level course designed for students in the Remote 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 Activators; Pumps and Motors; Directional Control Valves; Pressure Control Valves; Flow Control Valves; Hydraulic System Accessories

**Duration** - 10 weeks

**Lectures** - 3 hours/week = 30 hours total

**Laboratories** - 2 hours/week = 26 hours total

**Co-requisite** - PHYS 1100 (Physics) or PHYS 1101 (Physics)

**Duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 2 hours/week = 26 hours total

**FLDS 2201 (Marine Hydraulics)**

This intermediate course is 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 Pipings and Fittings, Seals and Packing, Components of Hydraulic Systems, Hydraulic Pumps and Motors (Rotary Actuators), Marine Applications of Hydraulics

**Prerequisite** - ENSY 1202 (Introduction to Marine Engineering Systems Design); PHYS 1200 (Physics); FLDS 2100 (Fluid Mechanics)

**Duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 2 hours/week = 26 hours total

**FLDS 3100 (Hydraulics and Pneumatics)**

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 Activators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories; Pneumatic Principles; Air Compressors and Receivers; Air Distribution and Auxiliary Equipment

**Prerequisite** - PHYS 1100 (Physics) or PHYS 1101 (Physics)

**Duration** - 13 weeks

**Lectures** - 3 hours/week

**Laboratories** - 2 hours/week

**FLDS 3105 (Hydraulics and Pneumatics)**

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 Activators; Pumps and Motors; Directional Control Valves; Pressure Control; Flow Control; Hydraulic System Accessories; Pneumatic Principles; Air Compressors and Receivers; Air Distribution and Auxiliary Equipment

**Prerequisite** - PHYS 1100 (Physics) or PHYS 1101 (Physics)

**Duration** - 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 2 hours/week = 26 hours total

**FLDS 3106 (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; Work and Energy of Fluids in Motion; Steady Flow of Incompressible Fluids; Flow Measurement

**Duration** - 3 weeks

**Lectures** - 6 hours/week = 18 hours total

**Laboratories** - 1 hour/week = 3 hours total

**FLDS 3107 (Hydraulic Controls)**

This is an intermediate level course designed for students in the Remote 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 Activators; 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

**FRMG 0001 (Fisheries Resource Management)**

This course is designed to familiarize fishermen 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 Operation/Fleet Separation; Stewardship

**Duration** - 5 days

**GEOG 1300 (Surveying and GPS)**

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.

**Duration** - 5 weeks

**Lectures** - 3 hours/week

**Laboratories** - 2 hours/week
COURSE DESCRIPTIONS

GEOG 1301 (Surveying and GPS)
This course is designed to enable students to develop 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 (EDMs).
Prerequisite: None
Duration: 6 weeks
Lectures: 3 hours per week = 18 total hours
Laboratories: 2 hours twice per week = 24 total hours

GEOG 2100 (Geography)
This course is designed to provide the student with an understanding of the types and uses of maps for use by marine environmental technologists. It also introduces students to calculations from maps and provides them with an introduction to digital mapping techniques and Geographic Information Systems (GIS) and Remote Sensing.
Introduction to Map Use; Projections and Coordinates; Map Scale and Calculations; Spatial Analysis and GIS; Remote Sensing and Aerial Photography.
Prerequisite: None
Duration: 13 weeks
Lectures: 3 hours /week
Laboratories: 1 hour/week

GEOG 2101 (Intermediate Surveying Practices)
This course provides students with an introduction to the theoretical, technical and practical application of intermediate surveying techniques and best practices. These will focus on intermediate surveying practices from a geodetic, horizontal positioning, vertical positioning and data telemetry perspective, including real-world applications and trends within this sector. 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.
Prerequisite: GEOG 1301 (Surveying and GPS)
Duration: 13 weeks
Lectures: 3 hours per week = 39 total hours
Laboratories: 2 hours once per week = 26 total hours

GEOG 2102 (Mapping and GIS)
This course introduces students to the application of maps in environmental problems. Computer-based applications such as Geographic Information Systems (GIS) and their use are emphasized.
Background to Digital Maps; Digital Mapping Data Models; Extraction and Application of Data from Maps; Geographic Information Systems; Recent Trends in Geographic Information Systems.
Prerequisite: GEOG 1301 (Surveying and GPS) or GEOG 2100 (Geography)
Duration: 13 weeks
Lectures: 3 hours per week = 39 total hours
Laboratories: 2 hours once per week = 26 total hours

GEOG 2200 (Remote Sensing)
This course will provide an introduction to remote sensing technologies, examining the electro-magnetic spectrum, acoustic 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); Electromagnetic (EM) Radiation; Multi-spectral Remote Sensing; Image Processing and Data Validation; Acoustic Remote Sensing in Water; Microwave and LiDAR Sensing.
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 3101 (Mapping and GIS)
This course is designed to introduce the student to the application of maps in environmental problems. Computer based applications such as Geographic Information Systems and their use are emphasized.
Background to Maps; Digital Mapping Data Models; Extraction and Application of Data from Maps; Geographic Information Systems; Recent Trends in Geographic Information Systems.
Prerequisite: GEOG 1301 (Surveying and GPS) or GEOG 2100 (Geography)
Duration: 13 weeks
Lectures: 3 hours per week = 39 total hours
Laboratories: 2 hours once per week = 26 total hours

GEOG 3102 (Mapping and GIS)
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 use 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 Altimeter; 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 use 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 Altimeter; Imaging Radars.
Prerequisite: GEOG 2200 (Remote Sensing)
Duration: 13 weeks
Lectures: 3 hours/week = 39 hours
Laboratories: 2 hours once per week = 26 total hours

GEOG 3200 (Web-based Mapping)
This course provides the student with an introduction to web-based mapping technologies, examining the electro-magnetic spectrum, acoustic 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); Electromagnetic 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 survey 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; OMAP 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 the utilization, evaluation and optimization of web-based mapping techniques and workflows.
Introduction to Web-based Mapping; Technical Aspects of Web-based Mapping; Web-based Mapping Development Environments; Web Programming; Geospatial Web Services; Geospatial Mashups; Mobile GIS; Geoportals; 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/week = 39 total hours
Laboratories: 2 hours once per week = 26 total hours
GEOG 3203 (Marine GIS and Nautical Cartography)
This course provides the student with an introduction to the theoretical, technical and practical application of marine GIS and nautical cartography techniques from an ocean mapping perspective. These practices will focus on specific marine and nautical applications associated with marine data management and nautical charting symbols 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.

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 - 2 hours once per week for 10 weeks (starting in week 2) = 20 total hours

GEOG 4100 (Remote Sensing)
This course will provide an introduction to remote sensing technologies, mapping 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 - 23 hours/week
Laboratories - 3 hours/week

GEOG 4103 (Aquatour Systems)
This 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
Prerequisite - GEOG 4100 (Remote Sensing); GEOG 4200 (Geographic Information Systems)
Duration - 8 weeks (20 hours)
Lectures - None
Laboratory - 4 hours/week (Two 2-hour labs/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; GIS Quality Evaluation; Recent Trends in GIS
Prerequisite - None
Duration - 13 weeks
Lectures - 3 hours/week = 39 total hours
Laboratories - 26 hours (2 hour lab per week)

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 4100 (Remote Sensing); GEOG 4200 (Geographic Information Systems)
Duration - 5 weeks (20 hours)
Lectures - None
Laboratory - 4 hours/week (Two 2-hour labs/week)
Pre-requisite - SFTY 1104 (WHMIS)
Duration - 1 Week (35 hrs)

MARP 0001 (Fishing Vessel Hull Repair and Maintenance - Fibreglass)
This course is designed to provide harvesters with knowledge and basic skills in the proper maintenance of the hull of their vessels. It focuses on the use of fibreglass material for the repair and maintenance of the hull of fibreglass fishing vessels.

Hull Maintenance; What is Fibreglass?; The Fibreglass Process; Hull Maintenance - Fibreglass)
Prerequisite - None
Duration - 13 weeks
Lectures - 2 hours/week per day
Pre-requisite - MATH 0102 (Mathematics)
Duration - 13 weeks
Lectures - 3 hours/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; Genral Maintenance & Log Book
Pre-requisite - None
Duration - 2 weeks (10 days)
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 Metal.
Prerequisite - MATH 0112 (Mathematics I)
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.
Prerequisite - Completion of Advanced Mathematics 3201 or Academic Mathematics 3202 as determined by the Department of Education, or equivalent.
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
Prerequisite - Successful completion of MATH 1100 (Pre-Calculus), or A grade of 70% or better in high school Advanced Mathematics 3201, or A pass in Advanced Mathematics 3201 or Academic Mathematics 3202 plus successful completion of a diagnostic testing procedure administered upon entry into first year.
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.
Functions; Analytic Geometry; Trigonometry; Algebraic Operations and Complex Numbers; The Derivative
Prerequisite - Diagnostic Test or MATH 1100 (Pre-Calculus)
Duration - 13 weeks
Lectures - 6 hours/week = 65 hours total OR
Duration - 13 weeks
Lectures - 6 hours/week for a total of 64 hours

MATH 1112 (NASC Mathematics II)
This is a course in pre-calculus mathematics designed to improve 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, Determinants and Matrices.
Prerequisite - Successful completion of high school level III advanced or academic mathematics or equivalent.
Duration - 13 weeks
Class Hours - 6 hours/week

MATH 1103 (Introduction to Calculus)
This is a course designed to prepare students for the study of calculus and give them a facility with the concepts of differentiation and integration necessary for a better understanding of a variety of technology courses.
Functions; Algebraic Operations and Complex Numbers; Trigonometry; The Derivative: Introduction to Integration
Prerequisite - Successful completion of MATH 1102 (Pre-Calculus)
Duration - 13 weeks
Lectures - 6 hours/week

MATH 1105 (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
Prerequisite - Successful completion of MATH 1100 (Pre-Calculus), or A grade of 70% or better in high school Advanced Mathematics 3201, or A pass in Advanced Mathematics 3201 or Academic Mathematics 3202 plus successful completion of a diagnostic testing procedure administered upon entry into first year.
Duration - 13 weeks
Lectures - 5 hours/week = 65 hours total

MATH 1201 (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
Prerequisite - MATH 1101 (Introduction to Calculus) 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.
Mensuration: 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
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) or equivalent
Duration - 13 weeks
Lectures - 6 hours/week

MATH 2102 (Mathematics)
This is a course comprised of a variety of topics designed to meet specific needs of the Nautical Science Diploma program.
Mensuration; Trigonometry; Geometric Construction; Interpolation; Moments; Trapezoidal Rule; Simpson’s Rule; Spherical Trigonometry
Prerequisite - MATH 1100 (Pre-Calculus)
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
Prerequisite - MATH 1200 (Calculus) or equivalent
Duration - 13 weeks
Lectures - 5 hours/week = 65 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
Prerequisites - MATH 1100 (Pre-Calculus) or MATH 1102; PHYS 1100 (Physics) or PHYS 1101 (Physics)
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 electro-mechanical technicians.
Statics - Analysis of Force Systems; Principal of Moments; Equilibrium; Friction; Dynamics - Kinematics of Rigid Bodies; Plane Motion; Kinetics of Rigid Bodies; Work, Power, and Energy; Simple Machines
Prerequisites - MATH 1102 (Pre-Calculus) or MATH 1101 (Introduction to Calculus); PHYS 1100 (Physics)
Duration - 13 weeks
Lectures - 4 hours/week Laboratories - 2 hours/2 week period
**COURSE DESCRIPTIONS**

**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** - MECH 1101 (Mechanics) or MECH 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

**Prerequisites** - PHYS 1100 (Physics); 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

**Prerequisites** - 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

**Prerequisites** - 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 course develops and expands the principles and theories of basic engineering mechanics and looks at the application of these principles to specific machine elements.

**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 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

**Duration** - 13 weeks

**Lectures** - 3 hours/week

**Laboratories** - 1 hour/week

**MECH 2209 (Theory of Machines)**
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

**Prerequisite** - CHEM 1100 (Chemistry) or CHEM 1101 (General Chemistry I)

**Duration** - 16 weeks

**Lectures** - 3 hours/week

**Laboratories** - 1 hour/week

**MECH 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

**MECH 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

**Lectures** - 3 hours/week = 39 total hours
COURSE DESCRIPTIONS

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.
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 overview of the program rational, particularly the three phases: description, analysis and synthesis that constitute the basis for the Coastal Zone Management Program.
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 Conflicts; Legal Issues; and Integrated Coastal Zone Management
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4105 (Coastal Resource Management)
This course will introduce participants to the concept of Coastal Ecosystem, Natural Resource, Ecological balance and Ecosystem dynamics. It describes the various types of coastal ecosystems and its main components. The main objective will be to provide participants with a multi-sectoral perspective of the different types of resources available in the coastal zones.
Basic Ecological Principles; Classification of Marine Environments; Adaptive Strategies of Intertidal Organisms; Diversity of the Intertidal Zone; Concept of Marine Resources; Living Resources; Mineral and Energetic Resources; Coastal Space as Resource; Resource Valuation and Decision Making
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4106 (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 Programs
Duration - 13 weeks
Lectures - 9 hours/week

MENV 4108 (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 Acknowledgment 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, resource value and management options through review of practical examples.
Type of Coastal Resources; Elements of Coastal Resources Management; Historical Overview of Managing Coastal Resources; Protecting the Coastal Environment; Development and Coastal Resources Management; Legal Aspect of Managing Coastal Resources; Interdisciplinary Tools for Resolving Coastal Conflicts; Managing Coastal Resources
Prerequisites - MENV 4105 (Coastal Resources)
Duration - 13 weeks
Lectures - 3 hours/week

MENV 4202 (Coastal Resources Management)
This intermediate level course is designed to provide 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
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

Prerequisite - Successful completion of Terms 1 and 2

Duration - 1 week

MIPG 4103 (Technical Problem Solving)

The 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 Phototoxins; Environmental Toxins; Animal Drug Residues; Food Additives; Toxins formed during Food Processing; Important facts of Foodborne Disease; Foodborne Intoxications; Foodborne Infections; Foodborne Toxicofoctions; Parasites and Algal Toxins; Food Sensitivities

Schedule - Web-based instruction (39 hrs total)

MIPG 4116 (Food Sanitation)

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 Sanitation Program; Facility Design, Maintenance and Construction

Prerequisites - None

Schedule - Web-based Instruction: 39 hours

MREK 0100 (Marine Engineering Knowledge)

This introductory course will provide students with the necessary knowledge and skill to gain employment in a marine related/technically oriented field, and through continued studies, to obtain a marine engineer’s certificate.

Safety; Introduction to Combustion Engines; Engine Systems; Introduction to Diesel Engines; Diesel Engine Fuel Injection Systems; Governors; and Supercharging

Duration - 16 weeks

Lectures - 12 hours/week Laboratoires - 10 hours/week

MREK 0200 (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 Compressions; 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 - 2 hours/week Laboratoires - 6 hours/week

MREK 0201 (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 hrs/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 - 5 hours/week + 12.6 hours total Laboratoires - 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; Air Compressors System; Air Compressor System; Air System; Steering Gear; Steam Boilers and Steam Plant

Prerequisites - MREK 1101 (Marine Engineering Knowledge I)

Duration - 13 weeks

Lectures - 5 hours/week

MREK 2101 (Marine Engineering Knowledge)

This is an introductory course designed to give students in the Naval Architecture program knowledge of marine engineering 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)

Duration - 13 weeks

Lectures - 3 hours/week Laboratoires - 2 hours/week

MREK 2102 (Marine Engineering Knowledge)

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 - NARC 1204 (Seamanship II)

Duration - 13 weeks

Lectures - 3 hours/week

MREK 2103 (Marine Engineering Knowledge)

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; Tribology 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 Laboratoires - 2 hours/week

MREK 2107 (Marine Engineering Knowledge)

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

Co-requisites - MATH 1101(Introduction to Calculus) MATH 1102(Mechanics); MATH 1103(Mechanics); MATH 2104(Introduction to Calculus) CHEM 1100 (Chemistry) MATH 1101(Introduction to Calculus) MATH 1102(Mechanics); MATH 1103(Mechanics)
MREK 2110 (Marine Engineering Knowledge I)
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: 3 hours/week
- Laboratories: 2 hours/week

MREK 2207 (Marine Engineering Knowledge II)
This course is designed for the marine engineering student who has completed the first workterm. This course will provide the student with the concepts of internal combustion engines and associated systems. 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; Fuels; Fuel Burning Systems; Waste Heat Recovery Systems; Fresh Water Generation and Treatment.
- Prerequisite: MREK 2101 (Marine Engineering Knowledge)
- Duration: 13 weeks
- Lectures: 8 hours/week

MREK 2209 (Marine Engineering Knowledge IV)
This course is designed to provide students with the knowledge of the fundamentals of refrigeration 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.
- Prerequisite: MREK 2208 (Marine Engineering Knowledge III)
- Duration: 5 weeks
- Lab: 2 hours/week = 26 hours total

MREK 3107 (Marine Engineering Knowledge V)
This course is designed to provide the student with the fundamentals of ship auxiliary equipment and shipboard systems.

- Prerequisite: MREK 2209 (Marine Engineering Knowledge IV)
- Duration: 13 weeks
- Lecture: 3 hours/week = 65 hours total
- Laboratories: 2 hours/week = 26 hours total
**COURSE DESCRIPTIONS**

**MREK 3204 (Marine Engineering Knowledge IV)**
This course is designed to expand on engineering concepts with respect to steam engineering knowledge, gas turbines and maintenance procedures.

- **Water Tube Boilers; Steam Turbines and Steam Plants; Boiler Water Treatment and Testing; Gas Turbines; Waste Heat Recovery Systems.**
- **Prerequisites**: MREK 3106 (Marine Engineering Knowledge III)
- **Duration**: 13 weeks
- **Lectures**: 6 hours/week = 65 hours total

**MREK 3205 (Marine Engineering Knowledge V)**
This course consists of Level I Propulsion Plant Propulsion Simulator course content and general engineering knowledge.

- **Introduction to Vibration; Sewage Plant and Pollution; Maintenance; Confined Space Entry; Deck Machinery; Exhaust Emissions; Oil Pollution Prevention Regulations; Propulsion Plant Simulator Course, Level I**
- **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

**MTPR 1200 (Materials and Processes)**
The purpose of this course is to provide students with knowledge of the behaviour and characteristics of common engineering materials and teach 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; Non-Metal Materials; Adhesives, Ceramics, and Wood**
- **Duration**: 5 weeks
- **Lectures**: 6 hours/week = 30 hours total
- **Laboratories**: 2 hours/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; Combined Bending and Direct Stress; Deflection of Beams**
- **Co-requisites**: 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; Plastics, Adhesives, Ceramics, and Wood**
- **Duration**: 13 weeks
- **Lectures**: 3 hours/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; Inspection and Testing of Materials; Corrosion; Plastics, Adhesives, Ceramics, and Composites**
- **Duration**: 13 weeks
- **Lectures**: 3 hours/week
- **Laboratories**: 2 hours/week

**MTPR 3100 (Strength of Materials)**
This second Strength of Materials course expands on previously studied concepts of 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 2100 (Strength of Materials) or equivalent
- **Duration**: 13 weeks
- **Lectures**: 3 hours/week
- **Laboratories**: 2 hours/week

**MTPR 3104 (Strength of Materials)**
This second Strength of Materials course expands on previously studied concepts of 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 hour/week = 26 hours total

**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/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**
- **Prerequisite**: PHYS 1102 (Physics); MATH 1101 (Introduction to Calculus); ENGR 1103 (Engineering Graphics); NARC 1103 (Ships & Shipping)
COURSE DESCRIPTIONS

**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.

**Duration** - 13 weeks
**Lectures** - 2 hours/week
**Laboratories** - 2 hours/week

**Prerequisites** - MATH 1100 (Pre-Calculus); ENSY 1202 (Introduction to MESEI)

**Co-requisite** - ENSY 1201 (Introduction to AutoCAD)

**Lines Plan; Draft and Trim; Coefficients of Hull Form; Integrating Rules and Methods; Tonnes per Centimetre of Immersion (TCP); Centre of flotation; Volume and Displacement; Buoyancy and the Centre of Buoyancy (VBC); LCD; Centre of Gravity; Hydrostatic Curves.**

**Prerequisites** - ENSY 1201 (Ship Types and Systems); NARC 1102 (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.

**Duration** - 13 weeks
**Lectures** - 3 hours/week

**NARC 2102 (Shipbuilding)**

This is the first of two courses to develop the students understanding of ship designs and rules and regulations which affect the design, construction, and repair of ships.

The Ship's Environment: Stresses on a Ship; Ship Construction Terminology; Plates and Sections; The Hull Girders; Construction Materials; Framing Systems; Construction Details; Interpretation of ship Drawings; Construction of Typical Ship Types; Fore End Structures; and Alt End Structures; Superstructures and Deckhouses; Ice Strengthening

**Prerequisites** - NASC 1204 (Seamanship II)
**Duration** - 13 weeks
**Lectures** - 3 hours/week = 39 hours
**Laboratories** - 1 hour/week = 13 hours

**NARC 2103 (Ship Stability)**

This course develops an understanding of statistical 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 Calibration; 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 2107 (Shipbuilding)**

This is the first of two intermediate level courses designed to give the students a working knowledge of the methods and practices of modern steel ship construction.

Fore End Structure; Alt End Structure; Rudders and Nozzles; Main Machinery, Auxiliary Machinery and Deck Machinery Seating; Shell; Casings Superstructures and Deckhouses

**Prerequisites** - MTTR 2104 (Materials & Processes); NARC 1101 (Ship Hull Geometry); NARC 1104 (Steel Ship Structure); MECH 2102 (Mechanics); MATH 1101 (Introduction to Calculus)

**Duration** - 13 weeks
**Lectures** - 3 hours/week
**Laboratories** - 2 hours/week

**NARC 2108 (Outfitting)**

This intermediate-level course is designed to give the student a working knowledge of the materials, methods and regulations used in the outfitting of steel ships.

Crew Accommodation Regulations; Joiner Bhds, Linings, and Ceilings; Deck Coverings; Insulation; HVAC; Furniture and Fittings; Ladders and Stairs; Anchoring and Mooring Equipment; Life Saving Equipment; Cargo Handling Equipment, Masts and Derrick; Hatches, Man Holes, and Doors; Painting and Preservation

**Prerequisites** - MTTR 2104 (Materials and Processes); NARC 1101 (Ship Hull Geometry); NARC 1104 (Steel Ship Structure); MECH 2102 (Mechanics); MATH 1101 (Introduction to Calculus)

**Duration** - 13 weeks
**Lectures** - 3 hours/week = 39 hours total
**Laboratories** - 2 hours/week = 26 hours total

**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; Hydrostatic Calculations; Hydrostatic Curves; Ship Mass and Center of Mass; Small Angle Stability; Longitudinal Stability and Trim

**Prerequisites** - Marine Engineering Systems Design
**Duration** - 13 weeks
**Lectures** - 3 hours/week = 39 hours total
**Laboratories** - 2 hours/week = 26 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 2101 (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 Resistance; Wave Making Resistance; Similarity and Model Testing; Systematic Series; Other Resistance Components; Propulsion; Powering Calculation; Fuel Consumption; Screw Propeller; Propeller Ship Interaction; Propeller Cavitation

**Prerequisite** - MATH 1200 (Calculus); NARC 2109 (Hydrostatics); MREK 2101 (Marine Engineering Knowledge)

**Duration** - 13 weeks
**Lectures/Laboratories** - 5 hours/week

**NARC 2202 (Ship Building)**

This course is designed to give the student's understanding of ship structures and the rules and regulations which affect the design, construction, and repair of ships.

Rudders; Steering and Manoeuvring; Welding and Cutting Procedures; Riveting; Shipyard Practice; Rules and Regulations; Structural Fire Protection; Waterline Divisions; Loadlines; Tonnage; Suicide 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
NARC 2208 (Ship Building)
This is the second of two courses to develop student understanding of ship structures and the rules and regulations which affect the design, construction and repair of ships. Stressors on a Ship; Ship Construction Terminology; Construction of Typical Ship Types; Construction Materials; Framing Systems; Keels and Bottom Structure; Shell Plating; Bulkheads and Pillars; Fore End Structures; Aft End Structures; Decks and Hatches; Superstructures and Deckhouses; Bulwarks and Freezing Ports; Ice Strengthening Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

NARC 2318 (Shipbuilding - Mechanical)
This is the second of two courses to develop student understanding of ship structures and the rules and regulations which affect the design, construction and repair of ships. Classification Societies and Regulatory Agencies; Tonnage, Freeboard and Hull Markings; Shipyard Practices; Engine and Boiler Rooms; Casings; Testing of Compartments and Tanks; Ventilators, Sounding, and Filling Pipes; Insulations; Safety Related Issuance and Mooring Arrangements and Testing Anchors and Chains Prerequisites - NARC 2228 (Shipbuilding) Duration - 5 weeks
Lectures - 6 hours/week = 30 hours total

NARC 3100 (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. Rudder Construction; Rudder Theory; Resistance, Powering, and Fuel Consumption; Propellers; Tailshafts and Propeller Mountings; Kurt Nozzles or Ducted Propellers; Voith Schneider Propulsion Units; Engine and Boiler Rooms; Casings; Superstructures and Deckhouses; Bulwarks and Freezing Ports; Testing of Compartments and Tanks; Shipyard Practices; Safety Related Issuances; Insulations; Ventilators, Air Sounding Pipes, and Filling Pipes; Tonnage, Freeboard, Fireproofing, and Hull Markings Prerequisite - NARC 2101 (Naval Architecture) Duration - 13 weeks
Lectures - 3 hours/week

NARC 3101 (Ship Design)
This course is designed to introduce students of Naval Architecture to the concept of rational design, and to provide them with the standard tools required. Mission Profile; State of the Art; Proportions; Lines; Hull Shape Calculations; Preliminary Structural Calculations; General Arrangement; Powering; Weight Estimate; Electrical Considerations; Machinery Considerations; Capacities, Trim and Stability; Damaged Stability; Regulations; Economic Considerations Prerequisites - MTPR 3201 (Strength of Materials); ELTK 2104 (Electrotechnology); MREK 2201 (Marine Engineering Knowledge); NARC 2101 (Ship Operations Management) Duration - 13 weeks
Lectures - 6 hours/week = 0 hours total

NARC 3108 (Boat Design - Composite Structure)
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 student to become familiar with Loadline and Tonnage regulations and their application. Throughout, emphasis is placed on calculations and presentation required by regulatory agencies. Dynamic Stability; Subdivision; Damaged Stability; Docking and Grounding; Launcing; Freeboard; Tonnage Prerequisite - NARC 2103 (Ship Stability) Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week

NARC 3109 (Rescue and Propulsion)
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. Resistance, Powering and Fuel Consumption; Propulsion Types; Propellers; Tailshafts and Propeller Mountings; Rudder Construction; Rudder Theory Prerequisites - NARC 3218 (Shipbuilding-Mechanical) Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

NARC 3200 (Naval Architecture)
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. Laws of Flotation; Coefficients of Form, Areas, Volumes, and Moments; Pressures and Centres of Pressure; Centre of Gravity; Free Surface Effects; Transverse Statical Stability; Waves and Rolling; Dynamical Stability; Longitudinal Stability; Change in Draft due to Bilging; Dry-docking and Grounding Prerequisite - NARC 3100 (Naval Architecture) Duration - 13 weeks
Lectures - 2 hours/week

NARC 3201 (Marine Electrical Project)
This is a project course designed for advanced Naval Architecture 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 Prerequisite - NARC 3102 (Ship Design); NARC 3104 (Preliminary Design Project); NARC 3203 (Hull Form Development Project) Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 3 hours/week

NARC 3202 (Marine Engineering Project)
The course project 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. Tanks Capacity Plan; Ship Systems Single Line Diagrams and Calculations; Shafting Arrangement (sketch); Preliminary Machinery Arrangement and List of Machinery Prerequisites - NARC 3102 (Ship Design); NARC 3104 (Preliminary Design Project); NARC 3203 (Hull Form Development Project); NARC 2201 (Resistance & Propulsion)
**Course Descriptions**

- **COURSE DESCRIPTIONS**
  - **Duration**: 13 weeks
  - **Lectures**: 3 hours/week = 39 hours total
  - **Laboratories**: 2 hours/week = 26 hours total

- **NARC 3203 (Hull Form Development Project)**
  - *This course develops an understanding of the factors influencing hull form design. Hand lines and computer-generated lines are developed by the student to satisfy particular design criteria. Throughout, emphasis is placed on practical application.*
  - **Prerequisites**: NTPR 3201 (Strength of Materials); ELTK 2104 (Electrotechnology); MREE 2201 (Marine Engineering Knowledge); NARC 2110 (Ship Operations Management)
  - **Co-requisites**: NARC 3102 (Ship Design); NARC 3104 (Preliminary Design Project)
  - **Duration**: 13 weeks
  - **Lectures**: 2 hours/week = 26 hours total
  - **Laboratories**: 3 hours/week = 39 hours total

- **NARC 3206 (Ship Structural Design Project)**
  - *This course is designed to expand and reinforce the knowledge gained in previous Ship Structure courses. Structural Logic; Scantling Approximations; Scantling Calculations; Detailing; Weight Estimate*
  - **Prerequisites**: NARC 3102 (Ship Design); NARC 3104 (Preliminary Design Project); NARC 3202 (Hull Form Development Project)
  - **Duration**: 6 hours/week; 78 hours total
  - **Lectures**: 13 hours/week; 169 hours total

- **NASC 1001 (General Ship Knowledge)**
  - *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 TP10936E.*
  - **Laboratories**: 2 hours/week = 26 hours total
  - **Lectures**: 13 hours/week; 169 hours total

- **NASC 6012 (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 TP10936E.*
  - **Laboratories**: 2 hours/week = 26 hours total
  - **Lectures**: 13 hours/week; 169 hours total

- **NASC 3020 (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 productions systems. Looking For Oil and Gas Offshore; Offshore Environmental Conditions; Environmental Loads on Offshore Structures; Offshore Exploration – Drilling Vessel Types and Selection; Offshore Exploration – Drilling Equipment and Operations; Offshore Production – Platform Types and Selection; Transportation and Installation of Offshore Structures; 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. Capabilities; 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**: 6 hours/week; 0 hours total

- **NASC 1100 (Orientation to Cargo Operations and Navigation)**
  - *An introductory course designed to explore the key aspects of a deck officer’s responsibility, namely navigation and cargo operations.*
  - **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 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 basic seafarer knowledge about ship terminology, navigation publications and stability.*
  - **Duration**: 5 weeks
  - **Lectures**: 12 hours/week

- **NASC 1102 (Basic Shipboard Rules)**
  - *This is an entry level course which will develop linkages between theoretical and practical seafarership.*
  - **Prerequisites**: NASC 1104 (Seamanship I)
  - **Duration**: 13 weeks
  - **Lectures**: 3 hours/week = 39 hours total
  - **Laboratories**: 2 hours/week = 26 hours total

- **NASC 1204 (Seamanship II)**
  - *This course follows Seamanship I and is designed to provide the student with knowledge of basic ship operations. A detailed analysis of the requirements of the Cadet Log Book will also be undertaken.*
  - **Prerequisites**: NASC 1104 (Seamanship I)
  - **Duration**: 13 weeks
  - **Lectures**: 3 hours/week = 39 hours total
  - **Laboratories**: 2 hours/week = 26 hours total

- **NASC 1303 (Shipboard Skills)**
  - *This course will build upon the knowledge gained in Seamanship Level I and Seaman's Level 2 courses to support practical shipboard skill development.*
  - **Prerequisites**: NARC 3208 (Ship Design-Fabrication)
  - **Duration**: 13 weeks
  - **Lectures**: 3 hours/week = 39 hours total
  - **Laboratories**: 2 hours/week = 26 hours total

- **NASC 3208 (Ship 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.*
  - **Prerequisite**: NARC 3301 (General ship Knowledge)
  - **Duration**: 13 weeks
  - **Lectures**: 2 hours/week = 26 hours total
  - **Laboratories**: 6 hours/week
COURSE DESCRIPTIONS

NASC 2101 (Stability I)
This course is designed to teach students the ability to perform basic stability calculations with emphasis on practical skills, to extract data from hydrostatic curves, and to perform calculations related to ships drafts, list, trim, and centre of gravity. Principal Ship Dimensions & Hull Terminology; Draft, Trim, Density & Displacement; Coefficients of Hull Form & Hydrostatic Data; TPC & FWA; Centre of Plottion; 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

NASC 2102 (Navigation Systems - SEN 1A1)*
NASC 2102 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.
*Successful completion required as partial requirement for SEN I (Transport Canada) credit.
Radar; Automatic Radar Plotting Aid (ARPA); Radar Plotting
Prerequisites - NASC 1303
Co-requisite - NASC 2108 (Navigation) (Physical Science I - 1A2)
Duration - 13 weeks
Lectures - 5 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 the 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.
*In order to get a credit for NASC 2103 (Seamanship) a pass must be obtained in the Morse Light section of the course. Ships; Deck Appliances; Lifting Gear; Rope; Wire and Chain; Advanced Rigging; International Code of Signals; Morse Code
Prerequisites - WKTM 1102 (Sea Phase I - Nautical Science) (Physical Science I - 1A2)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 1 hour/week

NASC 2104 (Principles of Cargo Operations & Navigation)
This course is designed to build on the basic knowledge acquired in NASC 2102 (Introduction to Cargo Operations) and to give the student an advanced understanding of the principles and practices of cargo operations.
IMDG Code; Deck Cargo Safety Code; General Cargo Vessels; Bulk Carriers; Oil Tankers; Container Ships; Code of Safe Practice for Solid Bulk Cargoes; Refrigerated Cargoes; Palletization of Cargo; Bulk Grain; Grain Loading Regulations; Coal Cargoes
Prerequisites - NASC 2112 (Introduction to Cargo Operations)
Duration - 13 weeks
Lectures - 4 hours/week - 52 hours total

NASC 2107 (Radio 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).
Restricted Operators Certificate - Maritime Commercial; Radiotelephony Communications Procedures; Radiotelephony Operating/Voice Procedures; Digital Selective Calling (DSC); Navigational Teles (NAVTEX); Emergency Position Indicating Radio Beacon (EPIRB) and Search and Rescue Radar Transponder (SART); Power Supplies and Maintenance
Prerequisites - None
Duration - 3 days - 21 hours
Lectures - 12 lecture / 9 practical

NASC 2108 (Navigation)
This is an introductory course in the fundamentals of the theory and practice of navigation. It is essential to have a sound knowledge of the basic skills of navigation and the ability to apply this knowledge, despite the many technological advances in marine navigation.
Navigation; The Terrestrial Sphere; The Nautical Chart; Nautical Chart Symbols and Abbreviations; The Compass; Direction; Navigational Aids; Obtaining a Position Line; Position Fixing; Current and Leeway; Tides and Tidal Streams; Publications; Electronic Charts
Prerequisite - NASC 1204 (Seamanship II); MATH 1112 (NASC Mathematics II)
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours
Laboratories - 6 hours/week = 78 hours

NASC 2111 (Introduction to Cargo Operations)
This course is designed to build knowledge about cargo operations onboard merchant vessels.
Ventilation; Ventilation Systems and Cargo Care; Cargo Stowage, Space Occupied, and Prevention of Damage; Securing Cargoes; Procedures for Receiving, Stacking and Delivering Cargo; Cargo Officer; Care of Cargo Stowing Cargo; Loading Stowage and Discharge of Heavy Weights; Requirements Applicable to Cargo-handling Gear; The Use of Vector Diagrams to Calculate Stresses on Cargo Gear; Cargo Calculations
Prerequisite - NASC 1204 (Seamanship II)
Duration - 13 weeks
Lectures - 3 hours/week = a total of 39 hours
Laboratories - 0 hours/week = a total of 0 hours

NASC 2200 (Navigation)
Celestial Navigation may be defined as the art and science of determining a ship’s position through observation of the celestial bodies - the sun, moon, planets, and stars. The instrument used to observe the heavenly bodies, the sextant, is symbolic of the history and tradition of the navigator. Although presently somewhat overshadowed by electronic systems, celestial navigation remains a basic and widely used procedure for determining position at sea.
This is an introductory course in celestial navigation. The emphasis will be on developing an in depth knowledge of the theory and terminology associated with nautical astrology.
Sailings; Nautical Astronomy; The Celestial Sphere; The Sextant; Altitude Correction; Time; The Marine Chronometer; The Nautical Almanac; Figure Drawings; Amplitudes, Azimuths, and Twilight; Body Identification; The Sailing
Prerequisite - NASC 2108 (Navigation) (Physical Science I - 1A2)
Duration - 13 weeks
Lectures - 4 hours/week - 52 hours total
Laboratories - 3 hours/week

NASC 2201 (Basic Tanker Safety)
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 an in depth knowledge required to work safely in this environment. This course meets and/or exceeds the standards set down in Transport Canada TP 81296.
Petroleum Tanker Design and Construction; Applied Science; Cargo Handling Systems; Operating Procedures; Inert Gas Systems; Crude Oil Washing; Safety in Tank Cleaning and Gas Freeing; Oil Pollution (Sea and Air); Fire Fighting; Emergency Procedures; Regulations and Codes of Practice; Safety Practices and Equipment; Health Issues; Safety in Terminal Operations; Environmental Response.
Prerequisites - NASC 2104 (Principles of Cargo Operations & Navigation); WKTM 1102 (Sea Phase I - Nautical Science) (Physical Science I - 1A2)
Duration - 28 hours (4 days)
Theory - 24 hours
Practical - 4 hours

NASC 2202 (Navigation Systems - SEN 1A2)*
NASC 2202 is the second 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 2202 is to provide the student with the knowledge and the skill required for the correct operation of navigational equipment.
*Successful completion required as partial requirement for SEN I (Transport Canada) credit.
Satellite Positioning Systems; Loran-C; Gyro Compass; Auto Pilot and Course Recorders; Echo Sounder; Log; Voyage Data Recorders (VDR); Automatic Identification System (AIS)
Prerequisite - NASC 2102 (Navigation Systems - SEN 1A1) (Physical Science I - 1A2)
Duration - 13 weeks
Lectures - 3 hours/week for 13 weeks = 39 hours total
Laboratories - 2 hours/week for 13 labs = 26 hours total

NASC 2203 (Seamanship)
This course is designed to further a cadet’s knowledge and practical understanding of work aboard a ship in preparation for becoming an efficient, effective junior officer. The concepts taught here will form the basis for further studies in seamanship.
Principles of Ship Handling; Anchoring; Mooring; Towing; Offshore Supply Vessel Operations; Navigating in Locks
Prerequisite - NASC 1102 (Basic Shipboard Rules); WKTM 1102 (Sea Phase I – Nautical Science) (Physical Science I - 1A2)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 1 hour/week

NASC 2207 (Navigation Safety and Communications)
The course in Navigation Safety and Communications covers the International Regulations for Preventing Collisions at Sea with Canadian modifications as contained in Transport Canada’s TP 1073. Radar and Communication Principles and recommendations as stated in the STCW Code sections A-VIII/2 and B-VIII/2. The course includes the International Code of Signals with Morse Code and emphasizes the importance of the proper use of IMO’s Standard Marine Communication Phrases. Also covered in the course is the use of Radio Aids to Marine Navigation and Annual Edition of Notices to Mariners.
General; Steaming and Sailing Rules: Lights and Shapes; Sound and Light Signals; Distress Signals; Exemptions and Canadian Provisions; Positioning and Technical Details of Lights, Shapes and Sound Signal Appliances; Additional Signals for Fishing Vessels Fishing in Close Proximity; Standard Watchkeeping Procedures and Practices; International Code of Signals; Morse Code; IMO’s Standard Marine Communication Phrases; Radio Aids to Marine Navigation; Annual Edition of Notices to Mariners
Prerequisite - WKTM 1102 (Sea Phase I) (Physical Science I - 1A2)
NASC 2300 (Navigation Systems - SEN)  
This course 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 professional bridge watchkeeping practices and procedures on a blind pilotage 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.  

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.703(17).  
Radio/Inmarsat Communication System Theory; Practical Radio Communication Operations on MF/HF; Practical Inmarsat Communication Procedures on Inmarsat-C, G, 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 System (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 (CAP2)  
Duration - 5 days (20 hours)  
Theory - 2 hours  
Practice - 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 Code of Signals, 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.  
Naviagation Procedures; Advanced Chartwork; The Magnetic Compass; Pilotage; GPS; and Navigation Passage Making/Planning  
Prerequisites - NASC 2108 (Navigation); WKTM 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 - WKTM 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; Liquidified Gas Carriers; Chemical Tankers; Passenger Vessels; Timber Deck Cargo; Coal Cargoes; Timber Deck Cargo; Coal; Cargo Regulations; Livestock; Coal Cargoes; 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 seakeeping 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; Ice Navigation; 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 intact stability. Practical skills to solve onboard ship stability problems are developed. The elements of Dynamic Stability are discussed and the IMO's Intact 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; Ex-Meridian Method of Sight Reduction; Longitude by Chronometer; Sight Reduction Tables and Sight Planning  
Prerequisites - NASC 2200 (Navigation); WKTM 2102 (Sea Phase II - Nautical Science)  
Duration - 13 weeks  
Lectures - 5 hours/week  
Laboratories - 5 hours/week  

NASC 3201 (GMDSS)  
This is a comprehensive course which enables radio station personnel, ashore and afloat, operating in accordance with the Global Maritime Distress and Safety System (GMDSS) to utilize efficiently all aspects of the GMDSS 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 (GMDSS); Regulations and Publications Pertaining to the GMDSS; Radio Theory; Practical Radio Communication Operations on VHF/MF/HF; Digital Selective Calling (DSC); Practical DSC Procedures on VHF/MF/HF; Inmarsat; Practical Inmarsat Communication Procedures on Inmarsat-A and C; Enhanced Group Call (EGC) Telex Over Radio (TOR); NAVTEX; Power Supplies & Maintenance; Emergency Position Indicating Radio-Beacon (EPIRB); Search and Rescue Transponder (SART)  
Prerequisite - NASC 2107 (Restricted Operator's Certificate - Maritime Commercial)  
Duration - 10 days  
Lectures/Practical Exercises - 0.5 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 - WKTM 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 2208 (Navigation Safety) and the seagoing experience gained during WKTM 2102 (Sea Phase II). Court judgments will be used to illustrate how various rules are applied; particularly when dealing with concepts such as proper look-out, full appraisal, safe speed and positive action in ample time.  
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  

COURSE DESCRIPTIONS
Lectures/Laboratories
Duration

194 195

emergencies, handle communications, maintain records correctly

know how to use the radar/ARPA, be familiar with the bridge

all those aboard. The OOW needs to be proficient in navigation,
at sea. The Officer of the Watch (OOW) is the Master’s

Phase II - Nautical Science)

Prerequisites

Practical Training

Ship Handling; Heavy Lifts and Cargo Lashing; On Board

observant cargo officers who are prepared to make cargo lashing

and responsible ship handler, and to prepare students to be

and understanding of the techniques required to be an efficient

professional seafaring officer.

Rigging

Prerequisites

NASC 3300 (Seamanship)

This course is designed to give students an advanced knowledge and understanding required to be an efficient and responsible ship handler, and to prepare students to be observant cargo officers who are prepared to make cargo lashing adjustments if and when necessary.

Ship Handling; Heavy Lifts and Cargo Lashing; On Board Practical Training

Prerequisites - NASC 3211 (Seamanship II); WKTM 2102 (Sea Phase II)

Duration - 13 weeks

Lectures - 5 hours/week = 65 hours total

NASC 3330 (Seamanship)

This course is designed to give students an advanced knowledge and understanding required to be an efficient and responsible ship handler, and to prepare students to be observant cargo officers who are prepared to make cargo lashing 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 (OWO) 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; Manoeuvring Data; Bridge Organization; Voyage Preparation; Officer of the Watch (OWO); Emergencies; Simulation

Prerequisites - WKT 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 Sextant; Meteorology; Ship Handling Principles; Steering Control Systems; Anchoring and Moorung Procedures; SH-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 II); WKTM 2102 (Sea Phase II)

Duration - 30 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 = 26 hours total

Laboratories - 2 hours once per week x 10 weeks = 20 hours total

Sea Time - One 3 hours session

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 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 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; The 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 multibeam 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; Calculating 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

OMAP 2301 (Data Processing and Visualization)

This course provides the student with the practical application of the technical capabilities associated with hydrographic data processing and visualization. It will be taught within a variety of analysis, offering an avenue for the student to become exposed to the elements required to process, analyze, visualize and disseminate a professional product.

Single Beam Echosounder Data Processing; Sub Bottom Profiler Data Processing; Side Scan Sonar Data Processing; Uncertainty Surface Processing; Metadata Attribution; Statistical Analysis; Data Visualization and Dissemination

Prerequisites - OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); OMAP 2201 (Multibeam Sonar); GEOG 2102 (Mapping and GIS) or equivalent

Co-requisites - OMAP 2300 (Field Deployment and Data Collection)

Duration - 10 days

OMAP 3100 (Shipboard System Integration)

This course provides the student with an introduction to typical mobilization practices necessary to integrate offshore surveying equipment and systems for marine surveying.

The course will be taught with reference to proper installation practices used for many of the surveying systems required to conduct a typical offshore oceanographic/hydrographic survey. This will serve as a framework that students can use to ensure proper system function and integration necessary for safe and efficient conduct of field operations.

Prerequisites - ELITX 1200 (Electrotechnology); ELITX 2118 (Introduction to Computer Networking)

Lectures - 3 hours/week = 39 hours

Laboratories - hours/week = 26 hours

OMAP 3101 (System Performance)

This course provides the student with the ability to understand and quantify the capabilities and limitations of hydrographic data collection systems.

Principles of Measurements and Associated Errors; Fundamentals of Total Propagated Uncertainty; Review of Acoustic Principles; System Parameter Definitions; Positioning and Altitude 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; Sidescan Sonar System Performance; Bathymetric Sidescan Sonar System Performance; Multibeam Sonar System Performance; Optical Depth Measurement System Performance; Future Performance of Hydrographic Data Collection

Prerequisites - OMAP 2000 (Underwater Acoustics Applications); OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); OMAP 2201 (Multibeam Sonar)

Duration - 13 weeks

Lectures - 3 hours/week = 39 hours

Laboratories - hours/week = 26 hours
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 seas, 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 Law

Prerequisites - GEOG 1301 (Surveying and GPS) or equivalent
Duration - 13 Weeks
Lectures - 3 hours per week = 39 total hours

OMAP 3201 (Applications of Underwater Acoustic Data)

This course will provide the student with a basic knowledge of the scientific, engineering, technical, 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. The student will also learn to independently carry a small research project using acoustic data.

The Development of Underwater Acoustics; Scientific Applications of Underwater Acoustic 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; OMAP 2200 (Remote Sensing); OMAP 2200 (Side Scan Sonar and Seismic Remote Sensing); and OMAP 2201 (Multibeam Sonar)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

OMAP 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 OMAP 2300 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 - OMAP 2300 (Field Deployment and Data Collection); OMAP 2301 (Data Processing and Visualization) Co-requisite - OMAP 3301 (Advanced Data Processing and Visualization) Duration - 7 days

OMAP 3301 (Advanced Data Processing and Visualization)

This course builds upon knowledge and skills gained in OMAP 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 - OMAP 2300 (Field Deployment and Data Collection); OMAP 2301 (Data Processing and Visualization) Co-requisite - OMAP 3300 (Advanced Survey Design and Implementation) Duration - 10 days

OMAP 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 - GEG 3101 (Mapping and GIS); GEOG 3200 (Remote Sensing); OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); and OMAP 2201 (Multibeam Sonar)
Duration - 13 weeks
Lectures - 2 hours once per week = 26 total hours
Laboratories - 2 hours once per week = 26 total hours

OMAP 3401 (Ocean Mapping Data Management Project II)

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 OMAP 3501.

Project Development; Project Data Scoping, Specifications and Management; Marine Data Types

Prerequisites - OMAP 2102 (Mapping and GIS); GEOG 2200 (Remote Sensing); OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); and OMAP 2201 (Multibeam Sonar)
Duration - 13 weeks
Lectures - 2 hours per week = 26 total hours

OMAP 3500 (Advanced Tides and Water Levels)

Lectures - 13 weeks
Laboratories - 3 hours per week = 39 total hours
Sea Time - One 3 hour session

OMAP 1201 (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 Processes 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

Prerequisites - ONGR 1302 (Hydrology and Tides)
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

OMAP 3501 (Ocean Mapping Data Management Project II)

This course follows successful completion of OMAP 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 - OMAP 3401*

*NOTE: There must be no longer than a three-semester period between completing OMAP 3401 and registering for OMAP 3501. If there is a longer period of time between these two courses, students must repeat OMAP 3401.

Duration - 13 weeks
Laboratories - 2 hours twice per week = 52 total hours

OMAP 3502 (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.


Prerequisites - OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); OMAP 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

OMAP 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 OMAP 2300 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 - OMAP 2300 (Field Deployment and Data Collection); OMAP 2301 (Data Processing and Visualization) Co-requisite - OMAP 3301 (Advanced Data Processing and Visualization) Duration - 7 days

OMAP 3301 (Advanced Data Processing and Visualization)

This course builds upon knowledge and skills gained in OMAP 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 - OMAP 2300 (Field Deployment and Data Collection); OMAP 2301 (Data Processing and Visualization) Co-requisite - OMAP 3300 (Advanced Survey Design and Implementation) Duration - 10 days

OMAP 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 - GEG 3101 (Mapping and GIS); GEOG 3200 (Remote Sensing); OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); and OMAP 2201 (Multibeam Sonar)
Duration - 13 weeks
Lectures - 2 hours once per week = 26 total hours
Laboratories - 2 hours once per week = 26 total hours

OMAP 3401 (Ocean Mapping Data Management Project II)

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 OMAP 3501.

Project Development; Project Data Scoping, Specifications and Management; Marine Data Types

Prerequisites - OMAP 2102 (Mapping and GIS); GEOG 2200 (Remote Sensing); OMAP 2200 (Side Scan Sonar and Geophysical Remote Sensing); and OMAP 2201 (Multibeam Sonar)
Duration - 13 weeks
Lectures - 2 hours per week = 26 total hours

OMAP 3500 (Advanced Tides and Water Levels)

Lectures - 13 weeks
Laboratories - 3 hours per week = 39 total hours
Sea Time - One 3 hour session

OMAP 1201 (Descriptive Oceanography)

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/ Stability; 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
**COURSE DESCRIPTIONS**

**ONGR 1300 (Hydrography and Tides)**
This course is designed to provide students with an understanding of hydrographic survey specifications and planning with respect to tides and water levels. It will introduce students to the principles and characteristics of tidal influence 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 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; Geologic Capabilities
Duration - 13 weeks
Lectures - 3 hours/week = 39 hours total

**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); FIDS 2100 (Fluids)
Duration - 5 weeks
Lectures - 8 hours/week = 40 hours total
Laboratories - 2 hours/week = 10 hours total

**ONGR 3100 (Meteorology)**
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 - WKTM 2102 (Sea Phase II - Nautical Science)
Duration - 13 weeks
Lectures - 3 hours/week

**ONGR 3101 (Meteorology II)**
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 Extra-Tropical 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); WKTM 2102 (Work Term 2)
Duration - 13 weeks
Lectures - 4 hours/week = 52 hours

**ONGR 3500 (Weather and Climate)**
The Earth’s climate system has 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 processes, 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 Geomorphology)
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.

The Nature of Physics; Describing Motion, Kinematics in one Dimension; Kinematics in two Dimensions, Vectors; Motion and Force, Dynamics; Circular Motion, Gravitation; Rotation, Kinematics; Bodies in Equilibrium; Work and Energy; Linear Momentum
Duration - 13 weeks
Lectures - 3 hours/week
Laboratories - 2 hours/week
This course is designed to give students an understanding of the concepts and requirements of quality assurance and control as applied to offshore steel fabrication, such as interpreting standards, controlling the acceptance of raw materials, and documentation and communications. It includes information on quality concepts, codes, standards, and applications.

Overview of Offshore Steel Fabrication, Quality Assurance and Control, Materials, Inspection, Requirements, Inspection Methods, QA Reports, Change Orders and Plan Approvals.

Prerequisite: Successful completion of all courses in Term 1 and Term 2
Duration: 5 weeks
Lectures: 60

QLAS 2104 (Food Evaluation)
This course is designed to provide an in-depth knowledge of the quality assessment techniques involved in the food industry.

Product Evaluation; Sensory Analysis; Viscosity Evaluation; Texture Evaluation; Colour Evaluation; Size, Shape, Symmetry & Style: Defects; Standards of Measurement and Calibration; Chemical Measurements

Prerequisites - FDTE 1100 (Introduction to Food Science & Technology)
Duration: 2 weeks
Lectures: 13 hours per week = 26 hours total
Laboratories: 19.5 hours once per week = 39 hours total

QLAS 3101 (Quality Assurance)
This course is designed to provide students with an understanding of the design and implementation of quality programs in the food industry.

Quality and The Food Industry; Quality Concepts; Quality of Design; Product of Design; Quality of Production and Processes; Quality Costs; Hazard Analysis Critical Control Point (HACCP); Food Safety Enhancement Program (FSEP); Quality Management Program (QMP); Total Quality Management (TQM); ISO22000:2005(E); Standard; British Retail Consortium (BRC); Standard

Prerequisites - FDTE 2112 (Food Sanitation); QLAS 2104 (Food Evaluation)

Co-requisites - BIOL 2202 (Microbiology); FDTE 3106 (Seafood Processing Technology)

Duration: 13 weeks
Lectures: 39 hours (3 hours/week)
Practical: 26 hours (2 hours/week)

ROVO 2200 (Introduction to ROV Systems)
This course is designed to familiarize students with the various types of ROVs and their essential system elements.

ROV Classifications; Control Cabin/Work Van Design and Function; External Generators/MG (Motor Generator) Sets; TMS (Telemeter Management System)/Vehicle Components and their Operating Principles

Duration: 13 weeks
Lectures: 3 hours per week = 39 total hours
Sea Time - One 3 hour session

ROVO 2201 (ROV Operations)
This course is designed to instruct students in the proficient and safe operation of underwater robotic systems throughout their full range of subsea applications.

Duration: 13 weeks
Lectures: 3 hours/week = 39 hours total
Laboratories: 2 hours/week (13 Labs) = 26 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 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; Preventative Maintenance Regimes.

Duration: 13 weeks
Lectures: 3 hours/week = 39 hours total
Laboratories: 2 hours/week (13 Labs) = 26 hours total

Prerequisites - ELTK 2118 (High Voltage Safety); FLDs 2108 (Introduction to Fluid Statics, Dynamics & Hydraulics); WKPR 2118 (Workshop Practice)

COURSE DESCRIPTIONS
### COURSE DESCRIPTIONS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROVO 2300 (ROV Ship Interaction)</td>
<td>This course is designed to teach the students the 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.</td>
<td>- 42 hours</td>
<td>This course is designed to familiarize the students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 42 hours</td>
</tr>
<tr>
<td>ROVO 3101 (ROV Operations)</td>
<td>This course is designed to instruct students in the proficient and safe operation of underwater robotic ecosystems throughout their full range of subsea applications. Basic Operations: Spheres of Operation; ROV Sub Systems Utilization.</td>
<td>- 39 hours total</td>
<td>This course is designed to teach the students to perform ROV operations in simulated environments. ROVO 3101 (ROV Operations); ROVO 3102 (ROV Maintenance); ROVO 3103 (Underwater Acoustic Applications); ROVO 3104 (Launch &amp; Recovery Systems or LARS). Duration: 39 hours total</td>
</tr>
<tr>
<td>ROVO 3102 (ROV Maintenance)</td>
<td>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; Preventative Maintenance Regimens.</td>
<td>- 26 hours total</td>
<td>This course is designed to instruct the students in the major facets of ROV maintenance. Basic Flying Protocols; Task Specific Flying Exercises; Flying in Heavy Currents Scenarios. Duration: 26 hours total</td>
</tr>
<tr>
<td>ROVO 3103 (Underwater Acoustic Applications)</td>
<td>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.</td>
<td>- 26 hours total</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 26 hours total</td>
</tr>
<tr>
<td>ROVO 3104 (Launch and Recovery Systems or LARS)</td>
<td>This course is designed to introduce students to the basics types, operation and maintenance of Launch and Recovery systems. Types of LARS: Dynacon A-frame, Pedestal Cranes, Miscellaneous System Elements: LARS Components, Lift Winches, Parking Platforms, A-frames and Control Stations.</td>
<td>- 12 hours total</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 12 hours total</td>
</tr>
<tr>
<td>ROVO 3012 (ROV Simulator Training)</td>
<td>This course is designed to give 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.</td>
<td>- 12 hours total</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 12 hours total</td>
</tr>
<tr>
<td>ROVO 3105 (ROV Ship Interaction)</td>
<td>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.</td>
<td>- 12 hours total</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 12 hours total</td>
</tr>
<tr>
<td>ROVO 3106 (Pilot Training)</td>
<td>This course is designed to instruct the students in the major facets of ROV piloting. Basic Flying Protocols in Simulated Environments; Simulated Flying Exercises.</td>
<td>- 28 hours total</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 28 hours total</td>
</tr>
<tr>
<td>SFTY 0001 (Basic Boat Skills)</td>
<td>This course is designed to instruct 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. 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.</td>
<td>- 21 hours</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 21 hours</td>
</tr>
<tr>
<td>SFTY 0200 (Workplace Safety Skills)</td>
<td>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.</td>
<td>- 4 hours</td>
<td>This course is designed to familiarize students with the various types of ROVs and their essential system elements. ROV Classification, Operation, and Maintenance. ROV Operations: Underwater Acoustic Applications (ROV Operations); ROVO 2205 (ROV Maintenance and LARS); OMAP 2000 (Underwater Acoustic Application) Duration: 4 hours</td>
</tr>
</tbody>
</table>
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 according to the Transport Canada Marine Safety regulatory requirements under TP 13008 Training Standards for Marine First Aid and Marine Medical Care. This course is designed for seafarers who would apply immediate basic first aid in the event of an accident or illness onboard a vessel.

Duration - 13 weeks
Lectures - 2 hours/week
Laboratory - 1 hour/week

SFTY 1104 (WHMIS)
This is an introductory course designed to inform students about the Workplace Hazardous Materials Information System (WHMIS)

Workplace Hazardous Materials Information System; Regulations; Chemical Hazards; Labelling; Material Safety Data Sheets; Confidential Information

Duration - 4 hours
Theory - 15 hours
Practical - 14 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 Professional 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; 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) within the past five years (Recommendation)

Duration - 21 hours
Theory - 16 hours
Practical - 5 hours

SFTY 1110 (Marine Advanced First Aid STCW A-VII/4)
This is an advanced first aid training course for seafarers that meets IMO: STCW Regulation VI/4 and STCW Code Section A-VII, 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 - 36 hours
Theory - 19 hours
Practical - 16 hours

SFTY 1114 (Basic Safety - STCW'95 VII)
This is a basic safety course for seafarers which meets IMO: STCW Regulation VI 1 and STCW Code Tables A-VII 1-1, 1-2, and 1-4, and requirements under TP 4957 in Marine Personnel Regulations in Basic Safety and in Marine Fire Fighting.

Introduction and Course Safety; Hazards, Emergencies, Emergency Preparedness and Response, Pollution Prevention; Firefighting Theory; Fire Prevention and Control Aboard Ships; Shipboard Fire Fighting Organization and Training; Practical Fire Fighting; Use and Care of Fire Fighting Equipment; Lifesaving Equipment and Abandoning; Survival; Communications; Rescue; Safe Working Practices; Effective Human Relations on Board Ships

Prerequisite - Marine Institute approved medical clearance;
Marine Institute approved first-aid training
Co-requisite - Marine Basic First Aid or Marine Advanced First Aid
Duration - 43 hours
Lecture - 21 hours
Practical - 22 hours

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.

Duration - 28.0 hours (4 days)
Theory - 24.0 hours
Practical - 4.0 hours

SFTY 1117 (Survival Craft - STCW'95 V1/2)
This course is designed to meet IMO/STCW'95 V1/2 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

Prerequisite - Marine Institute approved medical clearance;
SFTY 1108 (A1 - Basic Safety); SFTY 1109 (MED A2 - Small Vessel Safety), or SFTY 1114 (Basic Safety- STCW'95 V1/1)
Duration - 28 Hours
Lectures - 12 hours
Practical Exercises - 16 hours

COURSE DESCRIPTIONS
SFTY 1110 (Small Boat Navigation for Seamenhip)

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

SFTY 1112 (Confined Space Awareness)

This is an introductory course designed to provide students with an awareness of confined space issues and to familiarize them with the selection of specialized equipment required for safe entry into confined spaces.

Confined Spaces, Atmospheric Assessment, Puring 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 tons, 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 Rules; 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

SFTY 1126M (Standard First Aid with Level C-CPR and AED)

An approved training provider will deliver this three-day course.

SFTY 1123 (Oil and Chemical Tanker Familiarization STCW95 A-V/1)

This course applies to officers and ratings who will be assigned specific duties and responsibilities related to cargo and cargo equipment on oil or chemical tankers, taking into account section A-V/1 of the STCW Code to enable the participants to assume the duties and responsibilities relating to the loading, discharging or transfer of cargo and the operation of cargo equipment.

Oil Tanker; Chemical Tanker; Rules and Regulations; Basic Science Concepts; Oil Tanker Cargo Handling Systems; Chemical Tanker Cargo Handling Systems; Oil Tanker Operations; Chemical Tanker Operations; Health, Safety and Emergency Procedures; Pollution Prevention.

Prerequisite - SFTY 1114 (Basic Safety STCW 95 VII) equivalent; Marine Institute approved Medical Clearance

Duration - 60 hours
Theory - 55 hours
Practical - 5 hours

SFTY 1124 (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 the selection of specialized equipment required for safe entry into confined spaces.

Confined Spaces, Atmospheric Assessment, Puring and Ventilating, Entry Procedures, Respiratory Protection, Confined Space Entry Safety Equipment

Duration - 7 hours
Theory - 4 hours
Practical - 3 hours

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; Crowd 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; 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-V/11 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

Prerequisite - None
Duration - 6.0 hours
Lectures - 5.25 hours
Test - 0.75 hours

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
COURSE DESCRIPTIONS

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 Splicing
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).
Fall Protection Regulations and Standards, Fall Protection and Fall Arrest Systems, Components of a Fall Arrest System, Inspection of a Fall Arrest System, Assembly and Donning of a Fall Arrest System, Fall Protection Plan, Fall Protection System and Forces and Calculations, Accident/Incident Investigation, Rescue Considerations; Case Studies
Duration - 16 hours
Theory - 8 hours
Practical - 8 hours
SMALL VESSEL OPERATOR - Commercial/Fishing Vessels Training and Certification
This course is designed to provide candidates with the skills and knowledge to act as operator of a small commercial or fishing vessel in conformance with regulations of Transport Canada Marine Safety.
Introduction; Terminology; Vessel Hull Types and Configurations; Seamanship; Collision Avoidance Regulations; Safety on the Job; Marine Weather; Navigation, Positioning Equipment and Installations; Power Boat Operations; Search and Rescue; Resources; Protection of the Marine Environment; Departure Preparation; Quick Reference Checklists

STAT 2108 (Applied Statistics)
This course is designed to provide the student with a working knowledge of descriptive statistics and the statistical treatment and interpretation of data.
Sampling; Methods for Describing Sets of Data; Probability and Binomial Distribution; Normal Distribution; Inferences Based on a Single Sample; Estimation; Statistical Inference; Tests of Hypothesis; Analysis of Variance; Simple Linear Regression
Prerequisite - MATH 1100 (Pre-Calculus)
Lectures - 39 hours
Laboratories - 26 hours

STAT 4102 (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 - 39 hours/week
Laboratories - 2 hours/week

STAT 4103 (Statistics - Water Quality)
This course is 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 and Graphical Data Analysis; Probability and Probability Distributions; Inferences Based on a Single Sample; Point Estimation; Statistical Inference; Tests of Hypothesis; Analysis of Variance; One-Factor; Analysis of Variance: Two-Factors; Regression and Correlation
Duration - 13 weeks
Lectures - 3 hours per week = 39 total hours
Laboratories - 2 hours once per week = 26 total hours

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

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 (3 hours per week)
Laboratories - 26 hours (2 hours per week)

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 Soldering; Shielded Metal Arc (Welding); TIG (Tungsten-Inert-Gas Welding); SMAW (Shiled Metal Arc Welding) I; Build up of Metal Parts; SMAW II – Fillt Weld Flat and Horizontal (Part 1); Metallurgy, Expansion and Contraction Control; Jigs and Fixtue Fabrication.
Co-requisites - STWK 0108 (Fabrication Theory I); WKPR 0107 (Welding and Fitting Shop)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 2 hours/week

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; Dimly (Oxy-Fuel); SMAW (Shielded Metal Arc Welding) I; Build up of Metal Parts; SMAW II – Fillt Weld Flat and Horizontal (Part 1); Metallurgy, Expansion and Contraction Control; Jigs and Fixtue Fabrication.
Co-requisites - STWK 0107 (Welding Theory I); WKPR 0107 (Welding and Fitting Shop)
Duration - 13 weeks
Lectures - 2 hours/week
Laboratories - 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) Groove Weld All Positions; Procedure To Test Welds; Weld Fails; Fillt and Groove Weds on Medium and High Carbon Steel; Plasma Arc Cutting and Gouging.
Prerequisite - STWK 0107 (Welding Theory I); STWK 0108 (Fabrication Theory I); WKPR 0107 (Welding and Fitting Shop II)
Duration - 13 weeks
Lectures - 2/0
Laboratories - 2 hours per week
Laboratories - 13 weeks
Lectures - 3/0
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; Red Seal Program; Apprenticeship Progression Schedule; Apprenticeship Evaluation Process; Financial Incentives Available to Apprentices; Continuing Apprentice Training Outside Province of NL, Definitions.
Prerequisite - Successful completion of all courses in Term 1 and Term 2
Duration - 5 weeks
Lectures - 3/0
TKPR 310A/310B (Technological Project - Marine Engineering Technology)
The Technological Project is a linked course; TKPR 310B must be completed in the following academic term after TKPR 310A.
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
Prerequisite - TKPR 310A: Successful completion of CMSK 1201 (Communication at Work); MREK 3106 (Marine Engineering Knowledge); WKPR 2113 (Welding Shop), WKPR 2116 (Welding Shop), WKPR 2217 (Machine Shop), WKT 1103 (Work Term 1), and WKPR 3101 (Marine Maintenance 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
This is a linked course – TKPR 312B must be completed in the academic term immediately following completion of TKPR 312A.

Problem Solving and the Engineering Design Process; Project Identification; Project Research and Documentation; Progress Report; Oral and Written Draft; Project Research Report; Final Report Presentation; and Oral Report Presentation

Prerequisites - TKPR 312A - Successful Completion of all Term 3 and Term 4 Courses EXCEPT MATH 1200.

TKPR 312B - TKPR 312A Duration - TKPR 312A - 13 weeks Lectures - 5 hours/week Duration - TKPR 312B - 13 weeks Lectures - 5 hours/week

TKPR 3106A/B (Technical Project - Food Technology)

This course provides students with the opportunity to design, implement, and report on a technical project with potential benefits to the Canadian food processing industry. This is a linked course - TKPR 3106B must be completed in the academic term immediately following completion of TKPR 3106A.

Identification of Potential Projects; Project Selection; Design and Analysis; Reporting

Prerequisites - TKPR 3106A - BIOL 2202 (Food Microbiology); CMSTK 2102 (Interpersonal Communications); STAT 2108 (Applied Statistics); FDTE 2107 (Food Processing I); QAS 2104 (Food Evaluation)

Co-requisites - CHEM 2100 (Chemistry); FDTE 3100 (Food Engineering - Unit Operations); FDTE 3107 (Food Processing III)

Prerequisites - TKPR 3106B - TKPR 3106A Duration - TKPR 3106A - 39 hours TKPR 3106B - 78 hours

TKPR 317A/317B (Technical Thesis - Nautical Science Technology)

The technical project is a linked course; TKPR 317B must be completed in the academic term immediately following completion of TKPR 317A. The project completed in this linked course enables the student to utilize knowledge and skills developed throughout the diploma program.

Students taking this course will work as a group 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.

Project Identification; Teamwork and Group Dynamics; Project Analysis; Project Research and Documentation; Project Presentation

Prerequisites - TKPR 317A - Successful completion of Sea Phase 1, TS1 and TS2, and CMSTK 1201.

TKPR 317B - Successful completion of TKPR 317A and WKTMS 2102

Duration - TKPR 317A - 13 weeks Lecture - 2 hours per week Laboratories - 2 hours per week Duration - TKPR 317B - 13 weeks Lecture - 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; Preparation for Equipment and/or Material; Project Performance; Project Analysis; Project Reporting and Presentation.

Prerequisites - BTech (O):

CMSTK 1104 (Introduction to Technical Reporting); ELTR 1104 (Electronic Fabrication Techniques); WKTMS 2301 (Fitting Shop); CNTL 3215 (Instrumentation, Controls and Automation); CNTL 3231 (Advanced Programmable Logic Controllers - PLCs); ELTR 2214 (Microcomputer Interfacing); and ELTR 2217 (Electronic Troubleshooting).

BTech (UV):

CMSTK 1104 (Introduction to Technical Reporting); ELTR 1104 (Electronic Fabrication Techniques); WKTMS 2301 (Fitting Shop); CNTL 3215 (Instrumentation, Controls and Automation); CNTL 3231 (Advanced Programmable Logic Controllers - PLCs); ELTR 2214 (Microcomputer Interfacing); and ELTR 2217 (Electronic Troubleshooting).

TKPR 411A/411B (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 immediately following completion of TKPR 411A.

Identification of Potential Projects; Project Selection; Design and Analysis; Implementation; Reporting

Prerequisites - TKPR 411A - None

TKPR 411B - TKPR 411A Duration - TKPR 411A - 13 weeks Lectures - 2 hours per week = 26 hours total Duration - TKPR 411B - 13 weeks Other Requirements - 13 hours per week = 169 hours total.

TKPR 415A/415B/415C (Technical Project - Water Quality)

This course provides students the opportunity to design, implement, and report on a technical project related to various aspects associated with water and water use.

This is a linked course – TKPR 415A/B/C must be completed sequentially in the same academic year.

Identification of Potential Projects; Project Selection; Design and Analysis; Implementation; Reporting

Prerequisites - TKPR 415A - None

TKPR 415B - TKPR 415A TKPR 415C - TKPR 415B Duration - TKPR 415A - 6 weeks Lectures - 2 hours per week = 12 hours total Duration - TKPR 415B - 13 weeks Other Requirements - 3 hours per week = 39 hours total Duration - TKPR 415C - 5 weeks Other Requirements - 10 hours per week = 75 hours total.

TRMO 2100 (Thermodynamics)

This is an introductory course in thermodynamics. The course will provide the student with the basics of thermodynamics and its application to various processes.

Introduction to Thermodynamics; First Law and Applications; Second Law and Applications; Gas Laws; Processes; Gas Power Cycles.

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 413A/413B (Technical Project - Food Safety)

This course provides students the opportunity to design, implement, and report on a technical project with potential benefits to the Canadian food processing industry. This is a linked course – TKPR 413B must be completed in the academic term immediately following completion of TKPR 413A.

Identification of Potential Projects; Project Selection; Design and Analysis; Implementation; Reporting

Prerequisites - TKPR 413A - None

TKPR 413B - TKPR 413A Duration - TKPR 413A - 13 weeks Lectures - 2 hours per week = 26 hours total Duration - TKPR 413B - 13 weeks Other Requirements - 13 hours per week = 169 hours total.

TKPR 415A/415B/415C (Technical Project - Water Quality)

This course provides students the opportunity to design, implement, and report on a technical project related to various aspects associated with water and water use.

This is a linked course – TKPR 415A/B/C must be completed sequentially in the same academic year.

Identification of Potential Projects; Project Selection; Design and Analysis; Implementation; Reporting

Prerequisites - TKPR 415A - None

TKPR 415B - TKPR 415A TKPR 415C - TKPR 415B Duration - TKPR 415A - 6 weeks Lectures - 2 hours per week = 12 hours total Duration - TKPR 415B - 13 weeks Other Requirements - 3 hours per week = 39 hours total Duration - TKPR 415C - 5 weeks Other Requirements - 10 hours per week = 75 hours total.
### TRMO 2105 (Thermodynamics)
This is an introductory course in thermodynamics. The course will provide the student with the basics of thermodynamics and its application to various processes.

**Introduction to Thermodynamics; First Law and Applications; Second Law and Applications; Gas Laws; Processes; Gas Power Cycles.**

**Prerequisite:** PHYS 1103 (Physics); MATH 1100 (Pre-Calculus)

**Duration:** 13 weeks

**Lectures** - 3 hours/week = 39 hours total

**Laboratories** - 1 hour/week = 13 hours total

### TRMO 2200 (Thermodynamics)
This course follows from TRMO 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:** TRMO 2100 (Thermodynamics)

**Duration:** 13 weeks

**Lectures** - 3 hours/week

**Laboratories** - 1 hour/week

### TRMO 3010 (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 refrigeration.

**Refrigeration Cycles; Refrigeration Processes-Thermodynamics; Refrigerants-Properties; System Analysis; Component Analysis; Psychrometry; Air Conditioning Processes**

**Prerequisite:** TRMO 2100 (Thermodynamics)

**Duration:** 13 weeks

**Lectures** - 8 hours/week = 40 hours

**Laboratories** - 2 hours/week every week for 5 labs = 10 hours

### TRMO 3017 (Thermodynamics)
This course is an intermediate level course following TRMO 2100 (Thermodynamics) and TRMO 2200 (Thermodynamics) with specific applications to systems in the marine industry.

**Air Compressors; Steam Turbines; Gas Turbines; Heat Transfer; Heat Exchangers.**

**Prerequisite:** TRMO 2105 (Thermodynamics)

**Duration:** 5 weeks

**Lectures** - 6 hours/week

**Laboratories** - 1 hour/week

### TRMO 3103 (Thermodynamics)
This course is an intermediate level course following TRMO 2100 and 2200 with specific applications to systems in the marine industry.

**Air Compressors; Steam Turbines; Gas Turbines; Heat Transfer; Heat Exchangers.**

**Prerequisite:** TRMO 2100 (Thermodynamics)

**Duration:** 13 weeks

**Lectures** - 3 hours/week = 39 hours

**Laboratories** - 1 hour/week = 13 hours total

### TRMO 3106 (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 refrigeration.

**Refrigeration Cycles; Refrigeration Processes-Thermodynamics; Refrigerants-Properties; System Analysis; Component Analysis; Psychrometry; Air Conditioning Processes**

**Prerequisite:** TRMO 2100 (Thermodynamics)

**Duration:** 13 weeks

**Lectures** - 3 hours/week

**Laboratories** - 1 hour/week

### WKPR 0103 (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 0107 (Welding and 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; Oxygen-Fuel Cutting, Heating and Gouging; Fusion, Brazing and Braze Welding; SMAW I (Shielded Metal Arc Welding); Build-up of Metal Parts; SMAW II (Fillet Weld Flat and Horizontal); Metallurgy, Expansion and Contraction Control; Jigs and Fixtures**

**Co-requisite:** STWK 0109 (Fabrication Theory I); STWK 0107 (Welding and Fitting Shop I)

**Duration:** 13 weeks

**Laboratory - 0/13**

### WKPR 0200 (Machine Shop)
This introductory level course is designed to familiarize the student with the practical aspects of Gas Tungsten Arc Welding (GTAW).

**Gas Tungsten Arc Welding (GTAW) – 2 – Filet Weld All Positions, Mild Steel; Gas Metal Arc Welding (GMAW); Build-up of Metal Parts; SMAW II (Fillet Weld Flat and Horizontal); Metallurgy, Expansion and Contraction Control; Jigs and Fixtures**

**Duration:** 21 hours/week

### WKPR 0300 (TIG Welding)
This introductory level course is designed to introduce the student to the practical aspects of Gas Tungsten Arc Welding (GTAW).

**Gas Tungsten Arc Welding (GTAW) – 2 – Filet Weld All Positions, Mild Steel; Principles and Applications; GTAW Process; Filet Welds on Tee Joints in all Positions; Procedures Used To Test Welds; Weld Faults.**

**Prerequisite:** Successful completion of all courses in Term 1 and Term 2

**Duration:** 5 weeks Labs - 0/6

### WKPR 1103 (Fitting Shop)
This is a pre-employment skills training course designed to teach the student to identify and to select the proper tools for a given application. The student will also learn the safe and proper use of tools.

**Hand Tools; Wrenches; Special Tools; Precision Tools; Gasket Making; Value Stem Packing; Metal Shaping**

**Duration:** 13 weeks

**Laboratory - 4 hours/week**
WKPR 1104 (Machine Shop)
This is an introductory course designed to give instruction and hands-on practice in metrology, basic lathe operations, and the use and maintenance of bench grinders.
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 to identify and to select the proper tools for a given application. The student will also learn the safe and proper use of tools.
Hand Tools; Wrenches; Copper Tubing; Gasket Making; Valve Stem Packing; Piping; Metal Shaping.
Duration - 5 weeks
Lectures - 1 hour/week Laboratory - 7 hours/week

WKPR 1107 (Welding Shop)
This course is designed to provide students with step-by-step theoretical welding instruction and applications to permit them to develop practical skills in a welding shop environment. As the level of training progresses, students are shown how their newly developed skills can be used in repair techniques.
Welding Safety; Oxygen-Acetylene Cutting; Oxygen-Acetylene Welding; Oxygen-Acetylene Brazing; Testing.
Duration - 5 weeks
Lectures - 1 hour/week Laboratory - 7 hours/week

WKPR 1108 (Machine Shop)
This is an introductory course designed to give instruction and hands-on practice in basic lathe operations and bench grinders.
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; Machining 60-degree External and Internal Unified Thread; Thread Terminology.
Duration - 13 weeks
Lectures - 0 hours/week Laboratory - 7 hours/week

WKPR 1109 (Welding Shop I)
This course is designed to provide students with theoretical and practical oxygen/acetylene gas cutting and welding skills suitable for the marine environment.
Welding Safety; Oxygen-Acetylene Cutting; Oxygen-Acetylene Welding; Oxygen-Acetylene Brazing.
Duration - 5 weeks
Lecture - 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.
Shop Safety; Hand Tools and Wrenches; Electric and Pneumatic Hand Tools; Metrology; Copper Pipe and Tubing; Joints, Gaskets and Sealants.
Duration - 13 weeks
Lecture - 0 hours a week = 0 hours total Laboratories - 3 hours a week = 39 hours total

WKPR 1111 (Machine Shop I)
This is an introductory skills training course designed to give the student instruction and hands-on practice in basic lathe operations and bench grinders.
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; Machining 60-degree External and Internal Unified Thread; Thread Terminology.
Duration - 13 weeks
Lectures - 0 hours/week Laboratory - 4 hours/week = 52 hours total

WKPR 1200 (Fitting Shop II)
This is a skills-training course designed to give the student practice identifying and selecting tools for given applications. The student will practice using these tools safely and properly on shop projects.
Stationary Workshop Tools, Metal Fasteners, Piping, Alignment, Pressure Gauges.
Prerequisite - WKPR 1110 (Fitting Shop I) Duration - 13 weeks
Lecture - 0 hours a week = 0 hours total Laboratories - 3 hours a week = 39 hours total

WKPR 2104 (Fitting Shop)
This is a pre-employment skills training course designed to give the student practice in identifying and selecting the proper tools for a given application. The student will also practice the safe and proper use of these tools.
Special Tools; Metal Fasteners; Rigging; Minor Overhaul and Repair.

WKPR 2107 (Welding Shop)
This course is designed to give the student fundamental theoretical knowledge and to develop practical skills in electric arc welding.
Welding Safety; Metal Preparation; Electrode Selection; Welding Processes; Metalurgy of Welds; Welding Positions; Electric Arc Welding Processes; Destructive/Non-Destructive Testing.
Prerequisite - WKPR 1107 (Welding Shop) or equivalent
Duration - 13 weeks
Lectures - 2 hours/week
Shop Work - 6 hours/week

WKPR 2108 (Machine Shop)
This course is designed to add to, and to further develop skills acquired in WKPR 1108 (Machine Shop). The student will be given instruction and hands-on practice in the speeds and feeds for various machining operations, cutting fluids, power saws, drills and drilling (lathe), and taper turning, as well as in the use of steady and follower rests, and other lathe operations such as boring, reaming, knurling, parting, recessing, tapping, milling, machine speeds and feeds, indexing head, and machining of spur gears, machine ability of various metals, uses of Acme Threads, machining of Square Threads, the student instruction and hands-on practice in basic lathe operations and bench grinders.
Classification of ROV metals (Stainless Steels, Aluminum, and Titanium); Identification of ROV Metals; Properties of ROV Metals; Other ROV Materials; Special Topics; Welding Safety; Oxygen-Acetylene Cutting; Electrode Selection; Welding Processes; Welding Positions; Electric Arc Welding Processes; Hand Tools and Wrenches; Selection, Care and the Use of Files; Drills and Drill Presses; Selection and the Use of Taps and Dies; Metrology; Piping.
Duration - 13 weeks
Laboratories - 4 hours/week

WKPR 2111 (Fitting Shop II)
This is a skills training course designed to give the student practical and theoretical oxygen/acetylene gas cutting and electric arc welding knowledge that will permit them to develop skills suitable for the marine environment.
Welding Safety; Oxygen-Acetylene Cutting; Metal Preparation; Electrode Selection; Welding Processes; Metalurgy of Welds; Welding Positions; Electric Arc Welding Processes.
Prerequisite - WKPR 1109 (Welding Shop I) or equivalent
Duration - 13 weeks
Laboratories - 4 hours/week for 13 weeks = 52 hours

WKPR 2115 (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.
Hand Tools; Wrenches; Copper Tubing; Gasket Making; Valve Stem Packing; Piping; Metrology.
Duration - 5 weeks
Laboratory - 8 hours/week = 40 hours total

WKPR 2117 (Machine Shop I)
This is a skills training course designed to give instruction and hands-on practice in the safe and efficient use of Machine Shop tools and equipment.
Cutting Speeds and Feeds; Cutting Fluids; Sawing Machines; Drills and Drilling (Lathe); Taper Turning; Other Lathe Operations; Use of Steady and Follower Rests; Machine Shop Projects.
Prerequisite - WKPR 1117 (Machine Shop I)
Duration - 13 weeks/52 hours
Shop - 4 hours/week = 52 hours

WKPR 2118 (Workshop Practice)
This course is designed to provide students with a background in materials and materials processing specifically for ROV operations. Emphasis is placed on the safe, proper and suitable use of tools.
Classification of ROV metals (Stainless Steels, Aluminum, and Titanium); Identification of ROV Metals; Properties of ROV Metals; Other ROV Materials; Special Topics; Welding Safety; Oxygen-Acetylene Cutting; Electrode Selection; Welding Processes; Welding Positions; Electric Arc Welding Processes; Hand Tools and Wrenches; Selection, Care and the Use of Files; Drills and Drill Presses; Selection and the Use of Taps and Dies; Metrology; Piping.
Duration - 13 weeks
Laboratories - 4 hours/week

WKPR 2119 (MESD Workshop Practice)
This new course will give the student hands-on appreciation for the physical attributes and function of the machinery employed in the systems that they design in their other courses.
Safety; Pumps; Valves and Manifolds; Oilfield Water Separators; Air Compressors; Heat Exchangers; Puriﬁers; Boiler Systems.
Prerequisite - ENSY 1202 (Introduction to MESD)
Duration - 5 weeks
Laboratories - 4 hours/week Laboratory - 8 hours/week = 40 hours total

WKPR 2116 (Fitting Shop II)
This is a skills training course designed to give the student practice in identifying and selecting the tools for a given application. The student will also practice the safe and proper use of these tools in the completion of shop projects.
Special Tools; Metal Fasteners; Rigging; Fitting Shop Projects.
Prerequisite - WKPR 2115 (Fitting Shop I) or equivalent
Duration - 13 weeks/4 hours
Laboratory - 4 hours/week = 52 hours
Laboratories
- 13 weeks
Lectures - 1 hour/week
Laboratory - 6 hours/week

WKPR 3204 (Machinery Maintenance II)
This course is designed to give students increased understanding of preventative maintenance programs and knowledge of shipboard equipment, while providing hands-on experience equipment. In addition, the course will provide students with a background in materials and materials processing specifically for ROV fabrication. The Marine Diesel Mechanics Workbook is an integral part of the training program and provides a comprehensive summary of both practical and theoretical knowledge gained while on the work term. The student must complete all applicable questions to the best of his/her ability. The student must present this Manual to the Program Chair upon completion of the work term.

WKTM 0102 (Work Term - Preparation Seminar)
Schedule - Option 1: Sea-based work term
Students who are placed in a sea-based work term must complete a minimum of 60 Transport Canada approved calendar days as an engineering cadet signed-on onboard ship, have documented Transport Canada testimonials of sea service, must present acceptable proof of on-the-job performance using the School of Maritime Studies’ Employer Evaluation form, and must complete the Marine Diesel Mechanics Sea Phase Manual. This will result in graduate eligibility for the Engine Room Rating Certificate.

Marine Diesel Mechanics Sea Phase Manual:
The Marine Diesel Mechanics Sea Phase Manual is an integral part of the training program and provides a comprehensive summary of both practical and theoretical knowledge gained while on the work term. The student must complete all applicable questions to the best of his/her ability. The student must present this Manual to the Program Chair upon completion of the work term.

Option 2: Shore-based work term
Students who are placed in a shore-based work term must complete a minimum of 50 days duration documented by the Marine Diesel Mechanics Workbook. Note: Students who choose this option will not be eligible for the Engine Room Rating Certificate upon graduation.

Marine Diesel Mechanics Workbook:
The Marine Diesel Mechanics Workbook is an integral part of the training program and provides a comprehensive daily log of the student’s observations and activities. The student must present this Workbook to the Program Chair upon completion of the work term.

WKTM 0103 (Offshore Steel Fabrication Work Term)
WKTM 0103 is designed to provide the student with practical experience in offshore steel fabrication. To meet the graduation requirements of the Offshore Steel Fabrication Technical Certificate Program, the student must successfully complete WKTM 0103.

Prerequisites - Successful completion of all Technical Session courses.

Schedule - 80 hours

WKTM 0102 (Work Term - Preparation Seminar)
This is a short seminar course designed to prepare participants for the work term. Participants will have opportunities to develop professional work skills and techniques they will use during the work term experience.

Roles, Responsibilities and Benefits: The Placement Process;
Work Term Procedures

Duration - 6 weeks
Lectures - 6 hours (1 hour/week)
COURSE DESCRIPTIONS

WKTM 1102 (Sea Phase 1 - 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.

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 of Technology Program, the student must successfully complete a total of three (3) work terms.

Prerequisites - Successful completion of all Technical Session 1 courses
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.

WKTM 2103 (Work Term II - Marine Engineering)
WKTM 2103 is designed to ensure that the student gains practical experience under Option 1 or Option 2. Under Option 1 students continue development of the competency requirements of a Ship’s Engineering Officer; under Option 2 students gain additional Marine Engineering Technologist practical experience. Each successfully completed work term is regarded as one course credit.

Prerequisites - Successful completion of all Technical Session 2 courses
Duration - 8 weeks

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.

Prerequisites - Successful completion of any technical term immediately prior to the work term semester
Duration - 8 weeks

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.

Prerequisites - Successful completion of any technical term immediately prior to the work term semester
Duration - 8 weeks

WKTM 3101 (Work Term III - Marine Engineering)
WKTM 3101 is designed to ensure that the student gains practical experience under Option 1 or Option 2. Under Option 1 students continue development of the competency requirements of a Ship’s Engineering Officer; under Option 2 students gain additional Marine Engineering Technologist practical experience.

Prerequisites - Successful completion of all Technical Session 3 courses
Duration - 13 weeks

WKTM 3300 (Professional Orientation)
This course will provide students with more practical experience in the environmental field and the opportunity to further develop industry related work skills.

Prerequisites - Successful completion of all Technical Session 3 courses
Duration - 8 weeks

WKTM 3301 (Work Term - Food Technology)
This work term is intended to provide students with a second opportunity to learn, develop, and practice high standards of professional behaviour and performance while in the work environment.

Prerequisites - Successful completion of all Technical Session 3 courses
Duration - 13 weeks

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.

Prerequisites - Terms One, Two and Technical Session 3
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.
COURSE DESCRIPTIONS

**Prerequisites** - Terms One, Two and Technical Session
Advanced Diploma in Water Quality

**Duration** - 13 weeks

**WKTM 4111 (Advanced Diploma in Food Safety)**

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 4111 (Work Term - Food Safety)

**Prerequisites** - Terms One and Two Advanced Diploma in Food Safety

**Duration** - 13 weeks

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

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 4112 (Work Term - Sustainable Aquaculture)

**Prerequisites** - Terms One and Two Advanced Diploma in Sustainable Aquaculture

**Duration** - 13 weeks