

Ph.D Fisheries Science Comprehensive Examination Guidelines

Fisheries and Marine Institute, Memorial University of Newfoundland

Version 1.0

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SOF Academic Advisory Committee

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Purpose of this document

This document contains the policies, procedures, and regulations surrounding comprehensive examinations for Ph.D students in the Ph.D Fisheries Science program at the Fisheries and Marine Institute of Memorial University of Newfoundland.

These regulations are in addition to the School of Graduate Studies general regulations for comprehensive examinations: <http://www.mun.ca/regoff/calendar/sectionNo=GRAD-0024> and, if conflict exists, the SGS regulations take precedence.

Acknowledgments

We built these regulations after extensive review of the examination procedures of other departments. We particularly acknowledge the Department of Biology for clearly and extensively documenting their examination procedures. Many of the elements of our procedures were inspired by, or directly borrowed, from their regulations.

Background: Comprehensive Examinations

The Ph.D. is the highest academic degree one can receive in most countries. To get one, an individual has to demonstrate that they are not only extremely qualified in area of study, but are also able to place that research into a broader context, and understand the role their work will play in advancing knowledge. Ph.D. students demonstrate their achievement of this level of expertise through their dissertation and defense – but also through an intermediate step known as a “comprehensive exam”.

The comprehensive examination is an activity that typically takes place in the first half of a student’s program of study, and that serves to assess the knowledge that a Ph.D. student has gained to date. Just as importantly, it serves to determine whether the student has the capability to complete a high enough quality research program to warrant receiving a Ph.D. The vast majority of Ph.D. programs include a comprehensive exam, and they are sometimes referred to as a “candidacy exam” or “qualifying exam”.

The comprehensive exam is not to be taken lightly. It is a significant step in the graduate program, and must be passed in order to remain enrolled. Once a *Ph.D. student* passes the comprehensive examination, the student becomes a *Ph.D. candidate*. In this guidebook, we describe how comprehensive exams proceed in the Marine Institute School of Fisheries (SOF) Ph.D. program.

Exam Components

1. *Written examination (40% of grade)*

The student must produce a written paper, in the format of a literature review or essay, on a subject assigned by their examination committee. This subject may be aligned with the student’s thesis research, but is **not** a project proposal. In this paper, the student must demonstrate an ability to synthesize information. Students must demonstrate a comprehensive understanding of the assigned subject (and how the subject fits within the broader discipline of fisheries science).

The examination committee may require that the student read specific scientific papers or books, and demonstrate understanding of those sources by incorporating information from them into the written paper.

The paper should be formatted as follows:

- 1-inch margins
- Double-spaced
- Times New Roman font, size 12
- 20 pages **maximum**
- References in the format of the Canadian Journal of Fisheries and Aquatic Sciences (<http://www.nrcresearchpress.com/page/cjfas/authors#9d>)
- Additional pages including references, tables, and figures should be included as needed, and will not count towards the 20 page limit
- Must include a <= 200 word abstract on the first page.

The paper will be graded according to a rubric (see page 9). Any additional pages beyond 20 will be discarded. Each examiner will render a grade, and will issue a vote on whether to proceed to the oral examination. See the Assessment section for information on how this decision is made.

2. *Oral examination (25% of grade for presentation, 5% for written project proposal, 30% for Q&A)*

After the student passes the written examination, they will proceed to the oral examination. The oral examination consists of a written project proposal, an oral presentation, and Q&A.

Prior to the oral presentation, the student will submit a three page (maximum) written project proposal to the examination committee. The purpose of the written project proposal is to prepare the examination committee for the oral presentation. This outline should be of similar detail as what would be included in an NSERC Ph.D. scholarship application (see: Outline of Proposed Research in http://www.nserc-crsng.gc.ca/OnlineServices-ServicesEnLigne/instructions/201/pgs-pdf_eng.asp), but with a greater emphasis on methodology. It will be graded as per the rubric on Page 11.

The written outline must be formatted as follows:

- 1-inch margins
- Double-spaced
- Times New Roman font, size 12
- 3 pages **maximum**
- References in the format of the Canadian Journal of Fisheries and Aquatic Sciences (<http://www.nrcresearchpress.com/page/cjfas/authors#9d>) and included on separate page (does not count towards page limit)

In the oral examination, **which will be open to the public**, the Ph.D. student will produce a presentation (30 minutes or less in length), supplemented by a slide deck, that describes their proposed research program. This presentation should include a discussion of necessary background, should articulate the student's proposed methodology, and should clearly describe hypotheses that they seek to test. Further, it should place the research program into the broader context. Why does it matter that this question is being asked, and how will answering it advance the science or practice of fisheries?

It is expected that students make effective use of visuals during their oral presentation, including using and interpreting figures and data to articulate scientific concepts.

The oral presentation will be graded by the rubric on Page 10. The student must receive a passing grade (i.e. greater than 65%) on **all components of the oral examination**.

Question and Answer

The oral presentation will be followed by an extensive question and answer period. The candidate will be questioned by each voting examiner (and the Head or Delegate, if they choose to do so). **A white board or chalkboard should be present in the examination room**, so that the student can draw graphs to help explain concepts that arise during questioning. Each examiner will get up to 15 minutes to ask questions per round, and there will be two rounds of questions. The Q&A will be graded as per the rubric on Page 12.

Deliberation and final grading

After the completion of the question and answer period, the candidate and all spectators will be asked to leave the room, and the committee will deliberate *in camera* to discuss evaluations and arrive at a consensus. The student will be informed of the result after deliberation, and completed rubrics from each voting examination committee member will be provided to the student.

Regulations and Timeline - *Where, when, who, and how?*

Timeline

The examination must occur before the end of the 7th semester of enrollment, but students should aim to complete it sooner. The 4th or 5th semester is ideal. All required courses must be successfully completed prior to the comprehensive exam taking place.

Checklist

Action	Occurs within __ weeks of previous step:
<input type="checkbox"/> Supervisory Committee recommends examiners to AAC	
<input type="checkbox"/> AAC approves examiners, makes recommendation to Dean of Graduate Studies	1
<input type="checkbox"/> Dean of Graduate Studies appoints examiners	(as long as needed)
<input type="checkbox"/> Examination committee formed, recommends topic for written examination, and declares paper due date and date of oral examination*	2
<input type="checkbox"/> AAC approves written paper topic, Graduate Officer notifies candidate	1
<input type="checkbox"/> Candidate submits completed written examination to graduate secretary	6
<input type="checkbox"/> Graduate secretary forwards examination to examination committee	0
<input type="checkbox"/> Examination committee grades written examination. Based on grades, the committee either recommends or does not recommend that the oral examination proceed	2
<input type="checkbox"/> Student prepares written component of the oral presentation, and submits to examination committee	2
<input type="checkbox"/> Oral examination proceeds	1

*The date of the oral examination must be at least five weeks after the due date of the written paper (but not significantly more than five weeks), so as to allow for the timeline to proceed as written. Normally, these dates are determined by the examination committee first articulating a target date for the oral presentation, and then working backward to determine other due dates.

See also Figure 1, on page 13

Examination Committee

The composition of the examination committee will be as follows (all members are voting members unless otherwise specified)

- Exam committee chair: Head of the academic unit (or delegate)
- Student's supervisor
- Dean of Graduate Studies or delegate (**Non-voting member. This person only attends oral component and discussion**)
- Three other members

Aside from the senior supervisor, members of the student's supervisory committee normally may not serve on the examination committee (the only exception is in cases where no other local, qualified examiners are available, with the consent of the Graduate Officer). In cases where students have a co-supervisory arrangement, the co-supervisor may serve as one of the "three other members."

Outcomes

As per SGS regulations, the possible outcomes of a comprehensive examination are:

- Pass with distinction (Reserved for only the most exceptional cases, and must be decided unanimously)
- Pass
- Pass with conditions (The committee may require the student to, for example, take an additional course, but no re-examination is required)
- Re-examination
- Fail

We advise examiners to follow the process below in determining their vote.

Written examination: Each examiner will assign a numerical grade to the student based on the rubric (Page 8). If the examiner awards a grade of > 65% **in every assessment category**, they shall vote "yes" to allow the student to proceed to the oral examination. A simple majority result is needed to proceed to the oral examination.

If an examiner assigns a score below 65% in any one category of the rubric, they shall vote to require a re-examination (if it is the first examination). If the examiner assigns a score below 65% in more than one category, they may vote for re-examination, or may vote for the student to fail outright.

A failure can only be awarded on the first attempt if all examiners are unanimous in this opinion. If even one member votes otherwise, the student is given the opportunity to re-examine.

Only one re-examination is permitted. If the examination is not satisfactory on the second attempt, the student fails and their program is terminated.

In all cases, each examiner's completed rubric will be made available to the student, and will be included in their file.

Oral examination: Each examiner will assign a numerical grade to the student as per the rubric for the oral presentation (Page 10), the written project proposal (Page 11), and the Q&A (Page 12).

Examiners will total up their grades across all examination components and render a vote on the outcome of the overall comprehensive examination. A simple majority of 'passing' votes is needed for the student to pass the examination.

Examiners awarding a grade $\geq 65\%$ in every component (and therefore, $\geq 65\%$ overall) should vote for the student to either 'pass,' or receive a 'pass with conditions.' However, a 'pass with conditions,' from a voting perspective, is still a passing vote.

If a student receives $< 65\%$ for **any component** of the oral examination – even if their overall summed grade is a pass – the examiner may either vote for re-examination for the oral component only (which would include a project proposal, an oral examination, and a Q&A period), or vote for the student to fail overall (for a student to fail without opportunity to re-examine, the exam committee must unanimously vote 'fail'). Only one re-examination is permitted – if the student fails the re-examination, they are terminated from the program.

It is also possible for examiners to recommend a pass with distinction. Examiners must be unanimous in voting for this. While we do not articulate a specific grade cutoff for a pass with distinction, it generally should be a very high grade ($> 90\%$) in **all four components** of the examination, and examiners should feel that this student is likely to make a major impact in their field of research.

All completed rubrics will be provided to the student, and included in their file.

Conditions: Examiners may vote to pass the student with conditions, meaning the student must complete certain conditions after the conclusion of the examination. These conditions may include, for example, taking an additional specified course, or conducting a short literature review on a specific topic. The examination committee should determine conditions by consensus, and if a consensus cannot be reached, then the student receives a simple pass. Examiners may nevertheless make non-binding recommendations to the student.

Weighting:

Written examination: 40%

Oral presentation: 25%

Written project proposal: 5%

Q&A: 30%

Written topic selection

The student's written subject will be decided by the examination committee. The subject should relate broadly to the student's area of research, but be broad enough so as to force the student to engage both deeply and widely with scientific literature on the subject.

The written subject will normally fit within a general field, which may include:

- 1) Stock assessment
- 2) Quantitative methods in fisheries science
- 3) Fisheries technology
- 4) Post-harvest processing and biotechnology
- 5) Fisheries policy and practice
- 6) Fisheries ecology

Within that general field, the student will be tasked with addressing a specific subject. But it is critical that the student demonstrate a breadth of knowledge within their written examination, and the student must demonstrate that they can discuss their research subject within the context of academic literature. We encourage examination committees to select subjects that require students to place their work in the context of the ecology, management, and practice of fisheries that may be impacted by their work.

The student will not have input into selecting their subject.

Rubric: Written Examination

Written Examination Total Grade: /40	Notes:
<p>Body /25</p> <p>Abstract</p> <ul style="list-style-type: none"> - Abstract is high quality and provides an accurate summary of the paper <p>Introduction</p> <ul style="list-style-type: none"> - Research topic is clearly articulated - Ample background provided - Key concepts and theories well explained <p>Body</p> <ul style="list-style-type: none"> - Key citations from critical literature are included, and the findings from those papers are accurately described and contextualized - Evidence of advanced thought is demonstrated. Paper is not a list – it is a synthesis - Any figures and tables are clear and well-used - Arguments are well-supported by evidence and primary literature 	
<p>Presentation and Writing /10</p> <ul style="list-style-type: none"> - Paper is coherently written, with good spelling and grammar - Arguments are easy to follow - Sub-headings are logical, and paper is well-organized 	
<p>Formatting and Compliance /5</p> <ul style="list-style-type: none"> - Citations formatted correctly - Complies with rules (max 20 pages (not including references, figures, or tables), 12 point Times New Roman font, double spaced, one-inch margins)* <p>*Any pages beyond 20 will be discarded, and one mark will be deducted for every page above 20.</p>	

Examiner (Please print): _____

Date: _____

Does the student have >65% in all sections (Y/N)? _____ (If Y, vote to proceed is “Yes”)

If no, please indicate vote to proceed with oral, re-examine, or fail: _____

Rubric: Oral Presentation

Oral Presentation - Total Grade: /25	Notes:
<p>Content /15</p> <ul style="list-style-type: none"> - Clear introduction and background - Research questions are clearly articulated, and placed in the context of scientific literature - Content is accurate and well-synthesized - Proposed research methods are defensible and well-explained - Components of the research program clearly fit together, and relationships between them are well-explained 	
<p>Organization, Delivery, and Style /8</p> <ul style="list-style-type: none"> - Visual aids support the delivery - Text is large and readable. Figures are clear and high-quality - Talk is well-organized, and language and jargon are appropriate for an audience with generalist fisheries science knowledge - Talk is delivered articulately and clearly 	
<p>Formatting and Compliance /2</p> <ul style="list-style-type: none"> - Talk does not exceed 30 minutes in length - Talk includes slides 	

Examiner (Please print): _____

Date: _____

Rubric: Written Project Proposal

Written Project Proposal - Total Grade: /5	Notes:
<p>Content /3</p> <ul style="list-style-type: none"> - Written proposal should prepare committee for oral presentation - Ample background provided, backed up by appropriate amount of scientific literature - Methods clearly explained - Importance of research articulated <p>Note: This proposal should roughly follow the level of detail expected in an NSERC Ph.D scholarship application, but with slightly more emphasis on methodology</p>	
<p>Organization, Delivery, and Style /1</p> <ul style="list-style-type: none"> - Proposal is well-organized and easy to follow - Sub-headings used as appropriate 	
<p>Formatting and Compliance /1</p> <ul style="list-style-type: none"> - Citations formatted correctly - Complies with rules (max 3 pages (not including references), 12 point Times New Roman font, double spaced, one-inch margins)* <p>*Any pages beyond 3 will be discarded, and one mark will be deducted for every page above 3.</p>	

Examiner (Please print): _____

Date: _____

Rubric: Question and Answers

Question and Answer - Total Grade: /30	Notes:
<p>Content /25</p> <ul style="list-style-type: none"> - Demonstrates understanding of theory and concepts necessary to answer questions - Invokes relevant scientific literature in responses - Communicates answers, when needed, with multiple media (e.g. able to draw basic graphs on a chalkboard or whiteboard to explain concepts) - Acknowledges limits of knowledge, but does not dismiss them or attempt to cover up misunderstandings – does not dodge questions 	
<p>Organization, Delivery, and Style /5</p> <ul style="list-style-type: none"> - Answers questions clearly, completely, and articulately - Demonstrates active listening – asks clarifying questions as needed, engages in detail with examiners questions - Engages constructively with questions, rather than defensively 	

Examiner (Please print): _____

Date: _____

Voting tally

Total Score /100	Component score
Written	/40
Oral presentation	/25
Written project proposal	/5
Question and answer	/30

Overall vote:

- Pass with distinction
- Pass
- Pass with conditions
- Re-examine
- Fail

Specify conditions: _____

 Entire exam Oral only

Examiner (Please print): _____

Date: _____

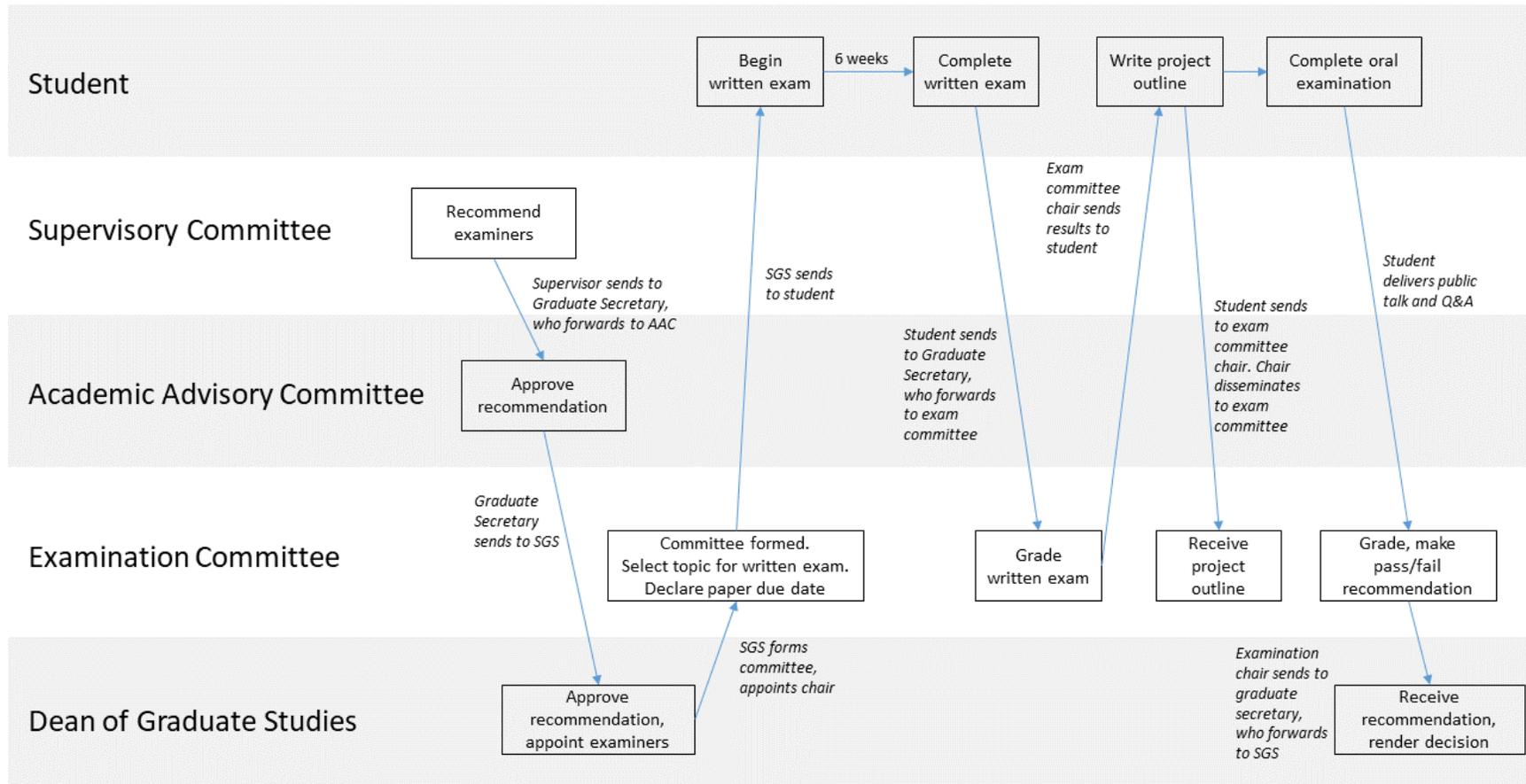


Figure 1: Examination flowchart, demonstrating key examination steps and the chain of custody of the examination file.