UNIVERSITY OF CALGARY | Cumming School of Medicine

GRADUATE PROGRAM HANDBOOK

Prepared for:

Graduate Science Education

Date

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Contents

Document Purpose

This document contains policies and procedures for programs administered through the Graduate Science Education (GSE) office. Information found here is also accessible through the GSE website.

Graduate Science Education Office Staff

The Graduate Science Education (GSE) office supports Graduate Students (for the purposes of this document to be known as students) and faculty in graduate programs in the Cumming School of Medicine (CSM). Graduate Program Administrators, assist the Associate and Assistant Deans, and Graduate Program Directors (GPD) in administering the policies and procedures of GSE and the Faculty of Graduate Studies (FGS).

In addition, the GSE office provides stipend set up support and scholarship information to students and faculty, and coordinates the Professional Development opportunities at the CSM.

A contact list is available in Appendix A: GSE Contact List

Vision:

To provide consistent and timely support to all students and faculty supervising students at the CSM. To be a resource for policy and procedure to ensure students are successful in their unique graduate programs and that they have a great experience while at the University of Calgary (UofC).

Purpose:

The GSE office is a place where current and future students, faculty and staff can come to receive information, support, and direction related to policies and procedures both from the GSE Graduate Education Committee and FGS.

Program Configuration

There are ten (10) Graduate Programs that are administered through the GSE office. These programs are either course-based or thesis-based. Each program adheres to general rules and also has program specific requirements and awards. For more information about the program specific requirements see each program's appendix as indicated below:

Appendix B: Biochemistry & Molecular Biology (MDBC)
Appendix C: Biomedical Technology (MDBT)
Appendix D: Community Health Sciences (MDCH)
Appendix E: Cardiovascular & Respiratory Sciences (MDCV)
Appendix F: Gastrointestinal Sciences (MDGI) | Immunology (MDIM) | Microbiology & Infectious Diseases (MDMI)
Appendix G: Medical Science (MDSC)
Appendix H: Neuroscience (MDNS)
Appendix I: Pathologist's Assistant (MDPA)
Appendix J: Leaders in Medicine (LiM)

Acronym Glossary

APR - Annual Progress Report

BMB - Biochemistry and Molecular Biology

CHREB - Conjoined Research Ethics Board

CHS - Community Health Sciences

CORE - Community Rehabilitation

CRDS - Community Rehabilitation and Disability Studies

CSM – Cumming School of Medicine

EAP - English for Academic Purposes

FGS – Faculty of Graduate Studies

FOS - Field of Study

GAT - Graduate Assistant Teaching

GPA - Grade Point Average

GPD - Graduate Program Director

GRE - Graduate Record Evaluation

GSE – Graduate Science Education

IELTS - International English Language Testing System

LiM – Leaders in Medicine Joint Degree Program

LOA - Leave of Absence

MBT – Master of Biomedical Technology Degree

MDBC – Biochemistry and Molecular Biology Program

MDBT – Biomedical Technology Program

MDCH – Community Health Sciences Program

MDCS - Master of Disability and Community Studies

MDCV – Cardiovascular and Respiratory Sciences Program

MDGI – Gastrointestinal Science Program

MDIM – Immunology Program

MDMI – Microbiology and Infectious Diseases Program

MDNS – Neuroscience program

MDPA – Pathologists' Assistant Program

MDSC – Medical Science Program

MELAB - Michigan English Language Battery

MPath – Master of Pathologists' Assistant Degree

MSc – Master of Science

NOE/NTOE - Notice of (Thesis) Oral Exam

PD - Professional Development

PDP - Professional Development Program

PhD – Doctor of Philosophy

PTE - Pearson Test of English

RI Day – Research Integrity Day

TOEFL - Test of English as a Foreign Language

UCID - University of Calgary Identification

UofC - University of Calgary

Admission

GSE graduate programs have a higher admission requirement than as listed by FGS. Application processes are competitive. Meeting all the requirements is no guarantee of gaining admission.

Application/Document Submission Deadlines

The deadlines, indicated in Table 1, are both applicant and supporting document deadlines.

Graduate programs of Biochemistry & Molecular Biology (MDBC), Cardiovascular & Respiratory Sciences (MDCV), Gastrointestinal Sciences (MDGI), Immunology (MDIM), Microbiology & Infectious Diseases (MDMI), Neuroscience (MDNS), and Medical Science (MDSC) have multiple start options. Biomedical Technology (MDBT), Community Health Sciences (MDCH) and the Pathologist's Assistant (MDPA) Graduate Programs only have one start date option.

Domestic Applicants include: Canadian Citizens and Permanent Residents

International Applicants include all others

Table 1. Admission Document Deadlines by Program

ADMISSION DOCUMENT DEADLINES

PROGRAMS	MDBC | MDCV | MDGI | MDIM | MDMI | MDNS | MDSC		MDCH	MDBT	MDPA
TERMS	**Domestic**	**International**	**All Applicants**		
FALL (SEPTEMBER)	June 1	April 1	January 31	May 1	March 30
WINTER (JANUARY)	October 1	August 1	No Intake		
SPRING (MAY)	March 1	December 1			
SUMMER (JULY)	May 1	February 1			

Online Application

Applications are completed using the online Student Admission Form. Applications are valid for one year (four terms) from the initial application date.

A non-refundable application fee is required per application.

Academic Requirements

Degree

Applicants must hold a four-year undergraduate degree from an accredited university for admission to a master's level program. PhD applicants must hold an MSc degree. The possibility of direct-entry to the PhD program from a bachelor's level program should be discussed with the Graduate Program Administrator.

Decisions to accept applicants with a three-year degree are done on a case-by-case basis. Contact the Graduate Program Administrator for details.

Grade Point Average (GPA)

Master of Science

BSc degree or equivalent

A minimum admission GPA of 3.30 (on the University of Calgary four-point system; equivalent to a "B+") based on the last two (2) years of the undergraduate degree consisting of a minimum of 60 units (10 full-course equivalents).

Doctor of Philosophy

MSc degree, or relevant master's degree, recognized by the Faculty of Graduate Studies, or transfer from MSc program, or, in exceptional cases, BSc degree or equivalent.

A minimum admission GPA of 3.30 (on the University of Calgary four-point system; equivalent to a "B+") based on the last two (2) years of the undergraduate degree consisting of a minimum of 60 units (10 full-course equivalents) and any master's course work if applicable.

International applicants can find their respective requirements by visiting Faculty of Graduate Studies (FGS) International Admission Requirements.

GPA below 3.30

Questions regarding admission with a GPA below 3.3 should be directed to the Graduate Program Administrator.

English Language Requirement

Applicants must demonstrate English language proficiency. Exemptions are based on whether the applicant's country of study is considered English exempt.

The English Language Requirement can be met in one of the following ways:

- Completion of a three- or four-year degree offered by an accredited university in a country the University of Calgary recognizes as English language proficiency exempt; or
- Completion of the University of Calgary's English for Academic Purposes (EAP) program. All three tiers must be successfully completed with a grade of 'B' or better; or
- Completion of one of the following English Language Tests meeting the minimum requirements as indicated in Table 2

Table 2. English Language Assessment requirements

Accepted English Language Assessments and Required Scores

TOEFL (Internet based)	TOEFL (Paper based)	IELTS (International English Language Testing System	MELAB (Michigan English Language Battery)	PTE (Pearson Test of English)
105	600	7.5	86	75

Note: *English language tests result cannot be more than two years old when the application is submitted*

Program Specific Pre-Requisites

Community Health Sciences (MDCH) - Master of Disability and Community Studies (MDCS)

A minimum of three (3) years' work/life experience related to this field.

Biomedical Technology (MDBT)

To have a competitive application, applicants should have courses in the following subject areas. Applicants do not need to have the exact course name/number listed below, but should have taken a course(s) in these subjects:

- BIOL 311 (Genetics) or MDSC 341 (Human Genetics)
- BIOL 331 (Cellular & Molecular Biology) or MDSC 351 (Honours Cellular & Molecular Biology)
- BCEM 393 (Biochemistry)

And senior level (300-400 level/3rd or 4th year level), specialty courses in two of the following topic areas:

- Microbiology
- Immunology
- Pharmacology
- Physiology

Applicants without the above recommended courses may still apply to the program, but are reminded that applications to the MBT program are competitive. Missing any of the recommended courses may reduce that applications competitiveness.

Graduate Record Evaluation (GRE)

Programs offered through the GSE office do not require GRE scores for admission purposes. However, individual supervisors may require these scores. Applicants need to discuss this issue with any prospective supervisors.

Supervision

Applicants are responsible for finding a supervisor to support their studies. It is recommended that a confirmed supervisor be in place prior to submitting an online application.

Exceptions:

- Biomedical Technology (MDBT) does not have a supervisor requirement
- Master of Disability & Community Studies (MDCS) supervisor is appointed after admission
- Master of Pathologists' Assistant (MDPA) supervisor is appointed after admission

Potential Supervisors

Biochemistry and Molecular Biology (MDBC)
Community Health Sciences (MDCH)
Cardiovascular and Respiratory Sciences (MDCV)
Gastrointestinal Sciences (MDGI)
Immunology (MDIM)
Microbiology and Infectious Diseases (MDMI)
Neuroscience (MDNS)

Medical Science (MDSC)

Guaranteed Funding

Students admitted to the CSM thesis-based graduate programs receive guaranteed funding from their supervisor at a minimum of $21,000/year for MSc and $23,000/year for PhD.

Funding should be discussed with a prospective supervisor prior to submitting the online application.

Exceptions:

Guaranteed funding is not provided for students in the Master of Biomedical Technology (MDBT), Master of Pathologists' Assistant (MDPA) or Community Health Sciences (MDCH) graduate programs.

Third Party funded students do not qualify for supervisor stipends.

Funding sources:

There are several different ways in which a student can be funded. Students are responsible for paying their own tuition and fees. Further information on these costs is available on the Faculty of Graduate Studies website.

Supervisor Stipend

The guaranteed funding is paid through a monthly stipend and are set up by the supervisor in accordance with the minimum program requirements. These payments are not employment income and do not qualify for statutory deductions.

External Funding

External funding consists of grants, awards and scholarships, not dispersed by the program.

Government Sponsored

Some government's sponsor or support students studying abroad. This is considered third party funding.

Cotutelle

See Faculty of Graduate Studies Cotutelle Program

Supporting Documentation Requirements

Applicants are responsible for ensuring all supporting documents have been uploaded before the program deadlines, refer to Table 1. This includes official transcripts, references and any other documents required by the program.

Documents submitted become the property of the University of Calgary and will not be returned or sent to another institution.

Check the "To Do List" in the MyUofC Student Center for a list of any documents still required. Contact the Graduate Program Administrator if there are problems uploading documents.

Supporting Documents to be mailed

Documents being mailed should be sent to:

(Graduate Program to which applicant is made), Graduate Science Education
University of Calgary - HSC G329

3330 Hospital Drive NW
Calgary, Alberta
T2N 4N1
Canada

Official Transcripts

One (1) official sealed transcript must be received from every post-secondary institution attended. Transcripts should be mailed directly to the GSE office by the issuing institution. Applicants who have attended the UofC do not need to send their UofC transcript. Official sealed transcripts previously submitted to the UofC from another post-secondary institution may be on file; contact the Graduate Program Administrator to ensure your transcripts are on record.

Degree statement not on transcript

If the transcript does not state the degree and date awarded, the institution(s) must be asked to submit one (1) official sealed copy of the Degree Certificate with the official transcript.

Transcript(s) not in English

Two (2) official sealed transcripts are required.

Send one (1) official sealed transcript(s) to a certified translator. The translator must mail the following to the GSE office in a sealed envelope:

- A verbatim, certified translation of the transcript;
- The original transcript used for translation

A second official sealed transcript in the original language must also be received by the GSE office.

English Language Test Score

An English Language test score must be sent by the testing company directly to the GSE office. University of Calgary institution code is 0813.

Supporting Documents to be uploaded

References

All applications require a minimum of two (2) academic references. When filling out the online application, applicants must enter their referees' names and current contact information. Note that email addresses must be from an institution or place of work (i.e.: not Hotmail, Gmail, Yahoo, etc.).

Once the application is submitted, referees will be sent an automated email with further instructions on what they need to provide. It is the applicant's responsibility to ensure that all reference documents are received by the GSE Office no later than the admission deadline.

Referees must be familiar with the applicant's academic or research background and be able to speak to their ability to study at the graduate level. All reference letters received must be written in English on institutional letterhead.

Should referee(s) have any questions about providing their reference, please have them contact the Graduate Program Administrator.

Exceptions: Biochemistry and Molecular Biology (MDBC) and Cardiovascular and Respiratory Sciences (MDCV) require three (3) references for PhD applications.

Applicants are responsible for ensuring referees have uploaded the reference letter and/or form prior to program deadlines.

Curriculum Vitae (CV) or Resume

An up-to-date CV or resume is required.

Exceptions: Cardiovascular and Respiratory Sciences (MDCV) does not require a CV or resume

Confirmation of Supervision and Guaranteed Funding

Confirmation of Supervision and Guaranteed Funding form is completed by the supervisor and applicant. See program for submission instructions.

Exceptions: Community Health Sciences (MDCH) requires a Supervisory Support Letter be sent to the program administrator by the proposed supervisor.

Course-based programs do not require supervisors or guaranteed funding.

Additional Supporting Documents

Biomedical Technology (MDBT) requires a Vision Statement outlining the reasons why the applicant would like to be admitted.

The Vision Statement should outline the reasons why the applicant would like to be admitted to the MBT program. It should be:

- one page in length
- single spaced
- written in size 12, Time New Romans font
- have the applicant's name on it

After You Submit Your Application

Applicants will receive an important email containing:

- A unique UofC Identification Number (UCID)
- Instructions on how to check the status of the application through MyUofC Student Centre
- How to upload the required supporting documentation

If there are any questions or concerns throughout the application process, please contact the relevant Graduate Program Administrator.

Application Review Process

After the application is complete, it will undergo a review process. Please allow 6-8 weeks* for processing once the application is complete and all documents are received.

*See programs for details:

Biochemistry and Molecular Biology (MDBC)

Biomedical Technology (MDBT)
Community Health Sciences (MDCH)
Cardiovascular and Respiratory Sciences (MDCV)
Gastrointestinal Sciences (MDGI)
Immunology (MDIM)
Microbiology and Infectious Diseases (MDMI)
Neuroscience (MDNS)
Pathologists' Assistant (MDPA)
Medical Science (MDSC)

Offers of Admission

Offer of Admission Letters are sent to the email address provided on the application. Paper copies of Offer of Admission Letters are not provided. Emailed copies of the offer are sufficient for applying for a study permit.

Program Time Limits

The maximum time to complete a Master of Science (MSc) degree is four (4) years and a Doctor of Philosophy (PhD) degree is six (6) years. Course-based programs allow for a maximum time of six (6) years. Students typically complete their degrees well ahead of these deadlines.

Should it be required, request for a program extension must be made using the "Program Extension Form" available on the FGS website. Justified requests that include all required information will be reviewed by the GPD and then forwarded to the Associate Dean - FGS for approval.

Required information for extension requests:

- Reason for extension
- Timeline for use of extra time
- Additional documents as requested

Figures 1 and 2 are examples of timelines for MSc and PhD students who have maintained satisfactory progress through their programs.

Sample Program Timelines

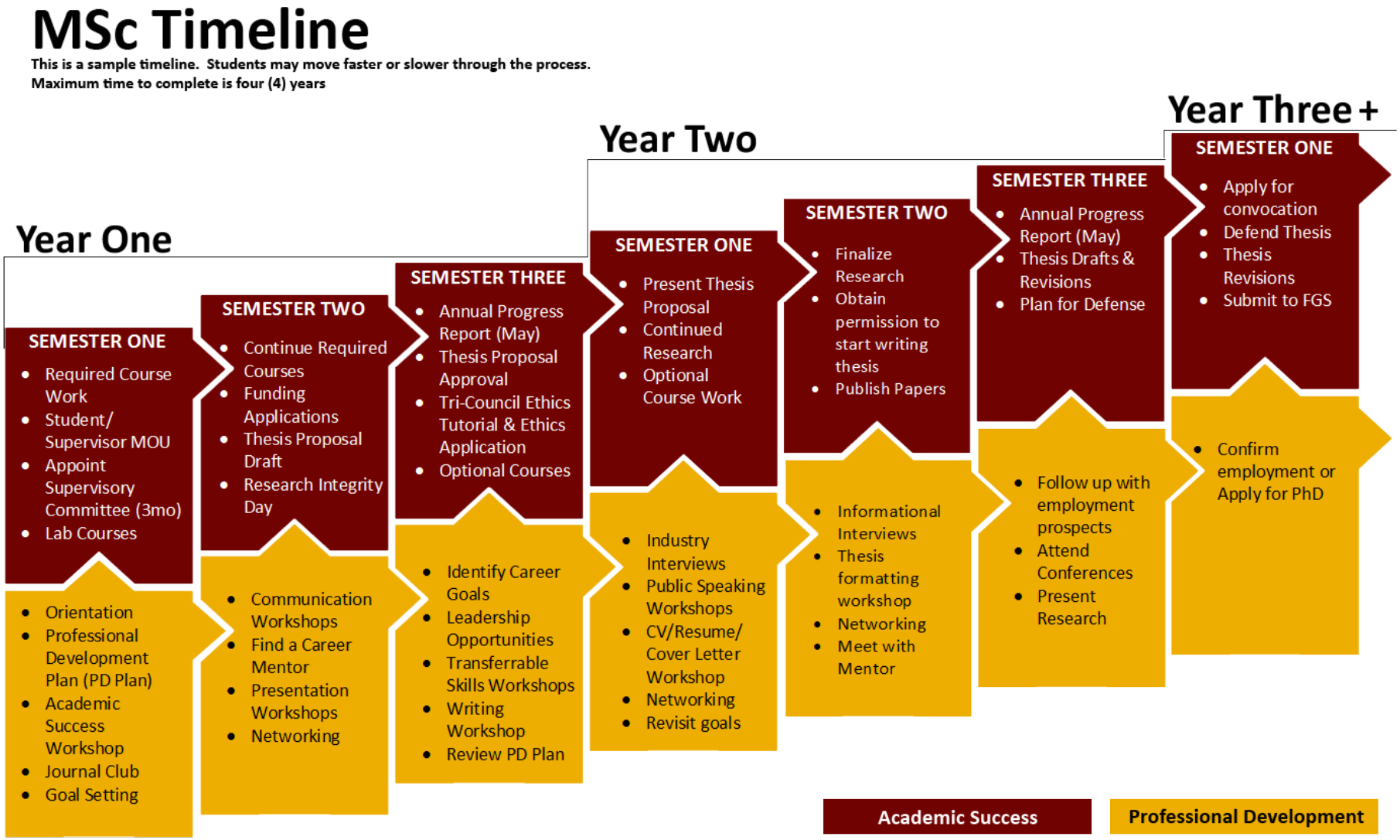

Figure 1. MSc Timeline Sample

PhD Timeline

This is a sample timeline. Students may move faster or slower through the process.
Maximum time to completion is six (6) years

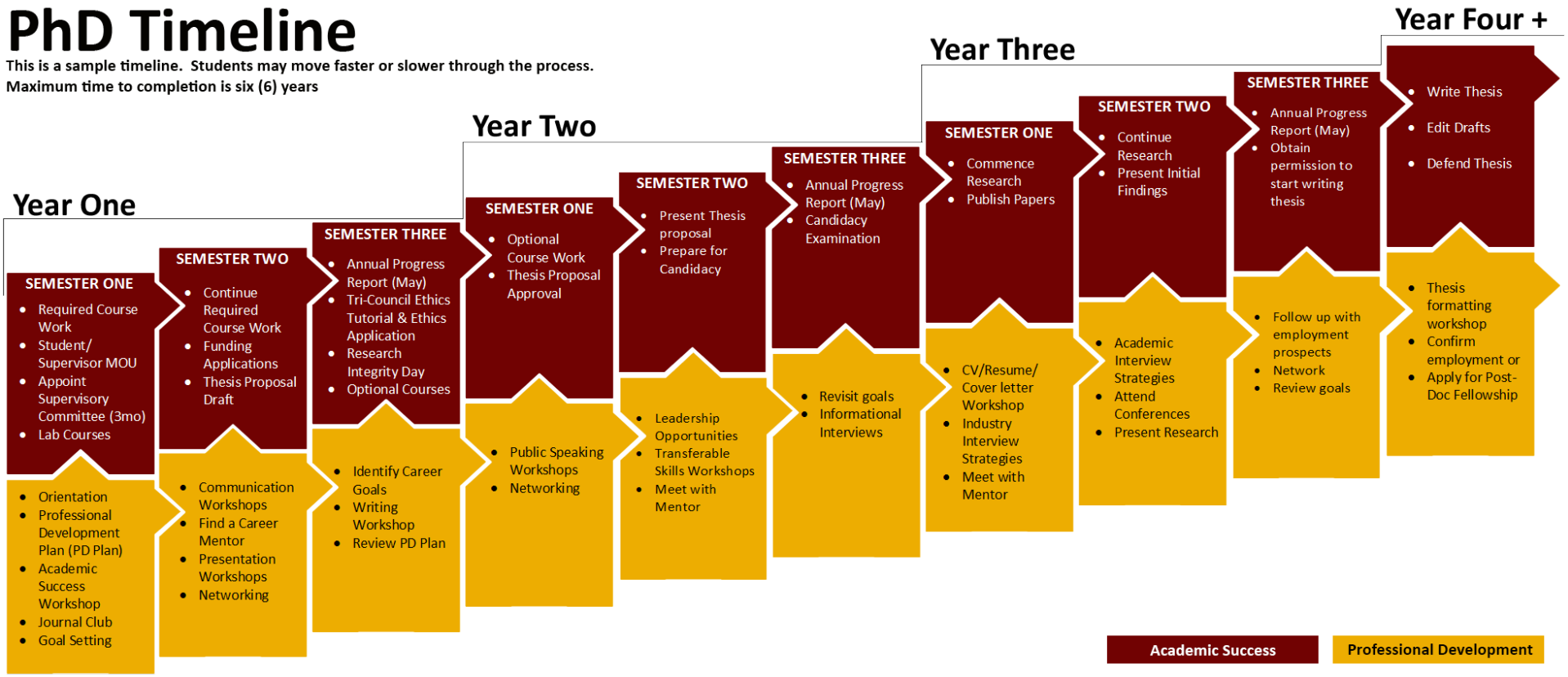

Figure 2. PhD Timeline Sample

Program Milestones

Milestones are the steps and activities required to complete degree requirements. These include: continued registration, course work, committee meetings, journal clubs, work in progress meetings, research integrity day attendance, annual progress report, candidacy exam (for PhD students) and thesis defense.

Registration

Initiation of registration is required at the beginning of each academic year for the duration of the program even when the student is not registered in courses. This is done through the MyUofC Student Centre. Failure to initiate the annual registration will result in withdrawal from the program.

Instructions on how to initiate/activate registration can be found here:
http://kb.ucalgary.ca/files/itkb/gs_registration_initialization_jun14j.pdf

The registration status is full-time, unless a student is in a course-based program with permission to attend part-time.

Annual Progress Report

The Annual Progress Report (APR) is mandatory for all thesis based students. It is completed online and includes sequential contributions from the student, supervisor, co-supervisor (if applicable) and GPD. It must be completed each year no later than May 31st. It is the student's and supervisor's responsibility to ensure that the APR is completed on time. If the supervisor is not able to complete their online portion or if there are other extenuating circumstances for non-completion of the report that can delay it beyond the deadline, the supervisor or student must contact their Graduate Program Administrator.

A "withhold" may be placed on the student's record if they fail to submit the APR on time. The "withhold" is removed after a completed report is submitted. See the Withhold Section for details.

An APR submitted at the end of the third year of an MSc program or the fifth year of a PhD program must include a detailed timeline, approved by the Supervisory Committee, outlining any additional work required for completion of the degree, and estimates of when the work will be completed, when the student will begin writing the thesis, and a tentative range of dates for the defense.

Course Requirements

In almost all cases, PhD students are required to take at three (3) graduate level courses, and MSc students are required to take two (2) graduate level courses. Exceptions need to be approved by the Supervisory Committee.

See Program Specific Appendices for detailed information about course requirements.

Program Specific Laboratory Certification

Students working with chemicals, biohazards, radioactivity, and/or animals must complete the necessary training requirements and certification prior to beginning their research project and/or working in the laboratory. All students are required to take the WHIMIS and Radiation Safety courses (offered through

Safety Services https://www.ucalgary.ca/safety/courses). Where appropriate, students should also arrange to take the relevant portions of MDSC 603: Use of Laboratory Animals in Biomedical Research.

Students working with human primary material or subjects also need approval from the Conjoined Research Ethics Board (CHREB) prior to initiating the research. The Supervisor may need to request the addition of the student to their ethics approval.

Supervisor Requirement

All students must have a permanent supervisor. It is understood that changes do occur within a student's program that can require supervisory changes.

Supervisory Status and Privileges

Faculty members who wish to supervise graduate students must apply for supervisory status/privileges. There are several steps, as represented in Figure 3, that must be completed before full and unrestricted approval is granted. The request is initiated by the faculty member emailing the respective Graduate Program Administrator of the program where they are going to be supporting students, this could be multiple programs, with their up-to-date CV and name of the student they are supporting. The Graduate Program Administrator will send a Recommendation for Supervisory Privileges form to be completed by the faculty member.

The GPD for each program holds the final say, pending FGS approval, on supervisory privileges. Supervisory privileges are granted through FGS and are reviewed on a five (5) year cycle.

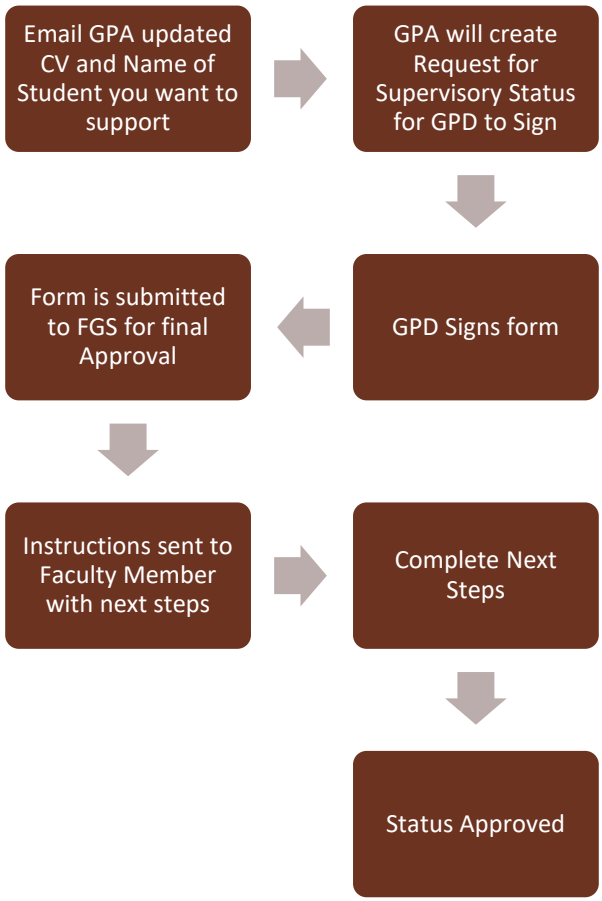

Figure 3. Steps for gaining supervisory status

Requesting Supervisory Privileges

Faculty interested in supervising students should first consult with their program requirements for the criteria for privileges. Basic guidelines are as outlined in Table 3; programs may add additional requirements.

Table 3. Supervisory Privileges Levels and Eligibility

SUPERVISORY PRIVILEGE LEVELS AND ELIGIBILITY CRITERIA

LEVEL OF PERMISSION	Description	Eligibility
RESTRICTED PERMISSIONS	- May be required to have a co-supervisor; - Only able to supervise MSc Students	- Limited or no supervisory experience, but hold a PhD or - Hold an MD and have limited supervisory experience
SPECIAL PERMISSION	- May supervise any level of student pending GPD and FGS approval. - May require a co-supervisor	- Non-board appointment - Emeritus
FULL PERMISSIONS	- No restriction on supervision; can supervise both MSc or PhD students	- Experience in supervising students either at UofC or another academic institution - Hold in MD/MSc or PhD degree

New Supervisor Orientation

After the above has been approved by the program, FGS will send a letter to the faculty member to attend the supervisor orientation. Only after the faculty member has competed the orientation is the approval process finalized.

Administrative Responsibilities of the Supervisor:

Supervisors are responsible for setting up the student's Supervisory Committee, all aspects of the Candidacy proposal approval meeting and exam and the Thesis Defense. This is done in consultation with the student under the Graduate Student Supervision Policy

Graduate Student Supervision Policy Section 5 (University of Calgary, 2015) states that Supervisors will:

a) complete the Checklist of Expectations between Supervisor and Graduate Student;
b) be familiar with the Best Practices for Supervisors;
c) assist the Graduate Student with the selection and planning of a suitable and manageable research topic with due consideration of the resources necessary for completion of the research project;

d) be accessible to the Graduate Student for consultation and discussion of the Graduate Student's academic progress and research;
e) respond in a timely manner to written work submitted by the Graduate Student with constructive suggestions for improvement;
f) achieve consensus, resolve differences, or seek outside opinions (e.g., Graduate Program Director) when there is conflicting advice or when there are different expectations on the part of Co-Supervisors or members of the Supervisory Committee;
g) be familiar with and abide by the rules and regulations of the Faculty of Graduate Studies, and the graduate program, including the chronological sequence of events and deadline dates in a Graduate Student's program;
h) assist the Graduate Student to be aware of current program requirements, deadlines, sources of funding, and general expectations of examinations;
i) complete the annual progress report and offer suggestions for improvement when deficiencies in progress exist;
j) encourage the Graduate Student to make presentations of research results within the University and to outside scholarly or professional bodies as appropriate;
k) acknowledge the contributions of the Graduate Student in presentations and in published material, including joint authorship, if appropriate; and
l) discuss with the Graduate Student the Intellectual Property Checklist (available at http://grad.ucalgary.ca/current/managing-myprogram/supervision) and conform to University and other policies regarding intellectual property, scholarly integrity (e.g., academic misconduct), and other policies applicable to the research environment including the Research Integrity Policy.

Financial Responsibilities of the Supervisor

Supervisors in lab-based studies, in GSE are required to guarantee a stipend of $21,000/year for MSc students and $23,000/year for PhD students. This is confirmed through the Confirmation of Funding Form that is available from the Graduate Program Administrator.

Exceptions: MDCH, MDBT, and the MDPA Programs

Guidelines for Resolving Student-Supervisor Conflict

It is understood that the supervisor-student relationship by its very nature is unique and can sometimes lead to several different types of difficulties. The purpose of these guidelines is to address this issue and to provide a vehicle for the resolution of difficulties encountered by either the student or the supervisor. It is understood that at any time the student or supervisor should feel free to approach the GPD, Head of their Department or Associate Dean GSE in confidence to mediate or for advice.

(i) Basic Assumptions

a. Both the supervisor and student should expect to be treated in a professional manner. This is not an employer-employee relationship but rather a teacher-student relationship, which involves a commitment on both sides.
b. Both the student and supervisor are expected to adhere to all the rules and guidelines of the UofC, FGS, GSE and their Graduate Program.

(ii) Manner in which Problems are to be Addressed

When student-supervisor relationship problems arise out of a personal or an academic nature, the parties should attempt to resolve the conflict by the procedures outlined below, in the following order:

a. When a problem develops in the view of either the supervisor or the student, the first step should be a meeting between the individuals to discuss and attempt to resolve the problem.
b. When the issue cannot be resolved between the two parties, either person should arrange a Supervisory Committee meeting. At the committee meeting, the issues in question should be addressed and a resolution should be reached. Minutes should be kept of this discussion and a copy should be forwarded to the student, Supervisory Committee members and the Graduate Program Administrator.
c. When either person feels that the Supervisory Committee has not dealt with the issues in question, or that this forum is not an appropriate avenue for the resolution of the problem then either person may bring the problem to the attention of the GPD or the Head of their Academic Department. The Department Head may appoint a Grievance Committee, if necessary, to mediate the dispute.

(iii) Associate Dean (GSE), Cumming School Medicine

Should either party be dissatisfied with the Grievance Committee recommendation, he/she must contact the Associate Dean (GSE) to discuss the problem and the reasons for the dissatisfaction with the recommendations. If the dissatisfied party is still unhappy with the Associate Dean's ruling, then as a final attempt to resolve the disagreement, a letter to the Dean, FGS, may be written. Copies of correspondence to the Associate Dean or to the Dean, FGS, should be sent to the Head of their Academic Department.

(iv) If a problem develops which cannot be resolved by initial consultations between the student and the supervisor, normally the student will be allowed to continue working in the laboratory while the grievance is being addressed through appropriate channels as outlined above. This will include problems resulting from charges initiated by either the student or the supervisor that require a grievance procedure, inquiry or investigative process. A student may be requested by the supervisor to forfeit his/her keys and work in the laboratory only when others are present during the normal working hours of that particular laboratory.

(v) If the Supervisor and/or GPD feels that it is inappropriate for a student to continue in the laboratory while a grievance procedure, inquiry or investigative process is underway, the Supervisor must present his/her case to either the Associate Dean (FGS), Associate Dean (Research), or the Dean, CSM prior to changing the locks or preventing access to the laboratory.

(vi) Students will continue to receive financial support during a grievance procedure, inquiry or investigative process within the CSM. If the supervisor is providing support, they are expected to continue that support until a decision is reached. If a decision is made to withdraw the student from the program, students will be notified in writing regarding the termination of their

support. Students will not be provided financial support during any FGS appeals process. The student will then not be allowed to continue in the laboratory during any FGS appeals process.

Changing Supervisors

It is expected that students will maintain the same supervisor throughout their program. However, there are some cases where changes need to be made and must be approved by FGS based on the recommendation from the GPD and Associate Dean, GSE. Review the "Guidelines for Requesting to Change Supervisors" (Faculty of Graduate Studies, 2015) for more information.

Due to the nature of the relationship between the student and supervisor changes to supervision is not recommended that a student change supervisors during their program. However, it is understood that there can be circumstances which require changes that occur within a student's progression through their program. Should a supervisory change need to be made the "Guidelines for Requesting to Change Supervisor" (Faculty of Graduate Studies, 2015) will be followed.

Supervisory Committee

Supervisory committees are required for all thesis-based students. These committees consist of Supervisor and Co-supervisor (if applicable), plus two additional members. Committee members are typically other faculty members who have expertise in advising students through their thesis work, however in some cases they can also member of the research community outside of the University of Calgary. Post-Doctoral Fellows (PDF) can be committee members in addition to the 2 or 3 faculty members. PDF's cannot participate in voting on candidacy processes or thesis defense if their supervisor is also part of the candidate's supervisory committee. Consult with the Graduate Program Administrator for specific details.

Supervisory Committee members are required to participate in Supervisory Committee meetings and formal evaluations and examinations of the student.

Functions of Supervisory Committee

The Supervisory Committee provides direction and expertise to the student to direct their research. This includes regular participation through feedback on the progress of the research in Supervisory Committee meetings.

Supervisory Committee members become examiners in the Candidacy Process and during the final Thesis Defense Examinations.

Research Integrity (RI) Day

Students are required to attend a RI Day, which is focused on Academic Integrity and Responsible conduct of research provided by the GSE Office. This is a CSM requirement and must be completed before completion of the Field of Study Examination (PhD) and Thesis Defense (MSc).

Work in Progress and Journal Club Requirements

Each student is required to participate in both journal club and work-in-progress seminar programs administered by the Institute or Research Group to which the student and his/her supervisor belong, and the student will present at least one (1) journal club seminar and one (1) work-in-progress presentation per year.

The MDBT, MDCH, MDNS and MDPA programs do not require work-in-progress or journal club presentations.

Research Proposal Requirement

Students are required to have an evaluated and approved research proposal. PhD student research proposals are formally evaluated and approved through the Admission to Candidacy process (See Admission to Candidacy Process for more information). MSc student research proposals are informally evaluated and approved through a committee meeting and the submission of the Thesis Proposal Approval Form found on the GSE website

MSc Proposals should be approved and submitted to the Graduate Program Administrator within 12 months of the start of the program.

The supervisor and committee will work with the student to determine the direction regarding content of the proposal.

Course-based students are not required to submit research proposals.

Program Transfers

Transferring from a Master's to Doctoral degree may be considered for exceptional students. Transfers must be requested through the GPD who will chair a supervisory committee meeting in which the program change is discussed. Transfers must be completed within the first twenty-four (24) months of a student's program.

PhD Transfer Checklist

Exception: Community Health Sciences Transfer Policy

Students are also able to transfer from a PhD to MSc program. However, this needs to be completed prior to the Candidacy Process being completed.

All transfers require a Change of Program/Status form to be submitted to FGS.

Doctoral Candidacy Process (Not MDCH)

Admission into candidacy in the CSM GSE Graduate Programs requires that students have a solid foundation of knowledge and comprehension of topics and concepts in their field of research. Students must demonstrate the ability to design a hypothesis-based research project that will contribute to their field, and display a solid understanding of the necessary technical skills required to complete their research project. In determining a student's suitability for candidacy, the following attributes will be assessed: breadth and depth of knowledge in the research area, clarity of thinking, ability to communicate clearly, critical thinking (ability to judge their own work and the work of others) and adaptive thinking (ability to integrate new ideas).

Requirements for admission to Candidacy

All doctoral students in the CSM GSE Graduate Programs must successfully complete the following components to be admitted to Candidacy:

- All academic course requirements
- Research Integrity Day
- Evaluation and approval of thesis proposal
- Field of study (FOS) examination (oral)

Evaluation and Approval of Thesis Proposal

A draft research proposal must be submitted to the student's supervisory committee within twelve (12) months of the student's initial registration in the Faculty of Graduate Studies. The Supervisor and supervisory committee members will provide research guidance to the student in the development of the project proposal, but the student must write the final document.

Research proposals must be between thirteen (13) and seventeen (17) single-spaced pages (excluding figures, tables and references, 0.75 inch margins and 12-point font). A suggested (but not mandatory) format for the research proposal is:

- Introduction (approximately 4-6 pages – should contain an appropriate literature review of the field and the project)
- Relevant Preliminary Data (approximately 3-4 pages)
- Hypothesis and Specific Aims (approximately 1/2 page)
- Experimental Plan (approximately 5-6 pages)
- Significance (1/2 pages)

After the initial submission of the proposal, the supervisor and supervisory committee will work with the student to develop a final version of the research proposal. A final version of the research proposal must be submitted and evaluated no later than twenty-one (21) months (for students directly entering into a PhD program) or twenty-five (25) months (for students who switch from an MSc program to the PhD program) of initial registration.

Thesis Proposal Evaluation Committee:

The thesis proposal evaluation committee will consist of the supervisor, supervisory committee members and one additional faculty-level evaluator who currently holds supervisory privileges within FGS (and who is approved by the graduate program). This person can be either internal or external to the student's graduate program.

Setting up Thesis Proposal Evaluation Committee Meeting

The purpose of the thesis proposal evaluation is to ensure that a student has sufficient preparation to be successful with their thesis research. The expectation is that the student has a clearly defined, novel and high-quality research plan that they can conduct and defend.

An evaluation committee meeting will be scheduled no later than twenty-one (21) months (for direct PhD entry students) or twenty-five (25) months (for MSc transfer students) after initial registration. A form describing the composition of the committee and date of meeting to approve the proposal shall be submitted to the graduate program administrator (GPA) no later than three (3) weeks before the proposed meeting date.

Proposal Evaluation

At least one (1) week before the Proposal Evaluation meeting, the student will submit their proposal to their supervisor, committee members, and one additional faculty-level evaluator. **No further revisions should be made to the proposal once it has been circulated.**

Evaluation committee members will each provide brief written feedback (Evaluators assessment of thesis proposal form) on the quality of the proposal and submit this feedback to the supervisor at the beginning of the Proposal Evaluation meeting. The student will be given a copy of the reports after the final meeting report has been submitted to the Graduate Program Administrator.

Written Evaluation:

The reviewers will decide if the written proposal can be accepted as submitted with minor or no further changes. The proposal will be evaluated based on:

- Relevant background knowledge to support the rationale of the proposed research project
- Preliminary data that demonstrates experimental competency
- Clear Hypothesis and Specific Aims of a body of work appropriate for a PhD project
- Detailed experimental plan with expectations, pitfalls and alternative approaches
- Significance of the proposed work within the research field

A unanimous decision of whether the written proposal is acceptable or unacceptable is required.

If the evaluators fail to arrive at a unanimous recommendation, the supervisor will adjourn the meeting and inform the Associate Dean – GSE of "lack of unanimity". The final decision will be at the discretion of the Associate Dean – GSE, CSM. Committee members will decide the nature of the revision during a post-evaluation discussion. Required changes will be summarized and communicated in writing to the student by the supervisor within one week (with a copy to the GPD and Graduate Program Administrator).

If a second Proposal Evaluation Meeting is required, the student will have up to six months to submit a revised proposal and hold a second meeting. This meeting will follow the same format as the first. If the second version of the proposal is not approved (either the written document or the student's ability to understand and defend their proposal), the student may be asked to withdraw from the PhD Program or transfer to the MSc Program.

Oral Evaluation:

Evaluators will consider the student's ability to:

- Understand the relevant background information
- Interpret and understand preliminary data
- Defend the hypothesis, specific aims and experimental plan

Proposal Evaluation Meeting Format

The Thesis Proposal Evaluation meeting should proceed in a similar manner to a regular committee meeting with the following additions:

- The student will do a short presentation ***(max 15 minutes)*** on their proposal at the beginning of the meeting

- Evaluation Meeting members should have the opportunity to discuss the proposal and question the student, focusing on the hypothesis and experimental plan. The student should be able to demonstrate an understanding of the background for the project, concepts, and methods employed as well as experimental interpretation and potential pitfalls. ***The Supervisor(s) should refrain from answering questions directed to the student. (Max 90 minutes)***
- Once the discussion is finished, the student must leave the room. The committee will then evaluate both the written document and the student's ability to defend their proposal and answer questions. ***The Supervisor(s) may participate in the discussion.***
- The committee will decide whether the proposal can be accepted as submitted or with minor revisions, and whether the oral evaluation is acceptable or unacceptable. This will be indicated on the Final Report on Thesis Proposal Evaluation. ***The Supervisor(s) does not vote.***

A unanimous decision of whether the oral defense of the proposal is acceptable or unacceptable is required. If the evaluators fail to arrive at a unanimous recommendation, the supervisor will adjourn the discussion and write a short report to inform the Associate Dean – GSE of "lack of unanimity". The final decision will be at the discretion of the Associate Dean – GSE, CSM.

If the oral is deemed unacceptable, a second Proposal Evaluation Committee meeting will be repeated within six months. If the second oral examination is not approved, the student may be asked to withdraw from the PhD Program or transfer to the MSc Program.

The timing of the Field of Study Examination may be adjusted to reflect any delayed approval of the proposal. An extension request form may be submitted to the Graduate Program Administrator for approval by the GPD.

Appeal of an Unacceptable Proposal Evaluation:

In the case of an unacceptable proposal, students have the right to appeal. Students must appeal directly to the FGS (see the Graduate Calendar – section O.2 Appeals Against Faculty of Graduate Studies Rulings).

Approved Proposals

Once approved, the field of study exam can move forward even if the project might evolve and change after the proposal has been approved. The proposal is an academic exercise testing the student's ability to write and defend a proposal. Delays to acquire more data are not appropriate and strongly discouraged.

A copy of the approved proposal will be provided to the Graduate Program Administrator along with a Thesis Proposal Evaluation Meeting Report Form, indicating that all Evaluation Meeting members have approved the proposal and its oral defense.

Field of Study (FOS) Oral Examination

PhD students in the CSM GSE graduate programs must complete a field of study (FOS) examination in their research area to fulfill Candidacy requirements. The FOS exam is a formal oral exam. The exam will be comprehensive, covering a broad range of topics in the student's core field of research. The student is expected to have an in-depth understanding of the topics related to their core field of research, as

well as a strong foundational knowledge in their field. These areas, as well as a detailed reading list will be provided to the student prior to the examination.

Students will not be re-evaluated on their written thesis proposal at this examination, which has already been evaluated and approved. The FOS exam is to be based on the broad field of knowledge required to carry out the research proposal as specified on the FOS preparation form, and not based on the proposal per se. To advance to candidacy, a student must be well versed in their area of research. They should be able to integrate their data into a broader context and understand how their research project will expand knowledge in their field. They should be able to understand the importance and relevance of their research.

Setting up the FOS examination

At least three (3) months before the FOS examination (this can be before the thesis proposal evaluation), the committee members will work together with the students to define a list of topics for study and a reading list for the exam (GSE FOS Examination Preparation Form). The specific number of topics may vary based on the student's background knowledge and area of study. The FOS exam will be scheduled no later than the twenty-four (24) months (for direct PhD entry students) or twenty-eight (28) months (for MSc transfer students) after the initial registration date.

At least four (4) weeks before the exam, the supervisor should notify the Graduate Program Administrator of the date, time and place of the exam, and composition of the examination committee. The Graduate Program Administrator will assign a Neutral Chair from the approved pool of Neutral Chairs.

FOS Exam Committee

The examining committee includes the Supervisor (and co-supervisor, both non-voting observers), at least two (but not necessarily all) of the student's supervisory committee members, and two faculty members external to the committee, one of whom is also external to the program. If an appropriate examiner cannot be found who is external to the program, an internal examiner can be selected if there is no conflict of interest and the examiner has been approved by the GPD.

Field of Study Exam

A copy of the student's Thesis Proposal, assigned study topics and reading list will be circulated to all members of the examination committee by the Graduate Program Administrator at least two (2) weeks before the exam.

The exam will last up to two (2) hours. There will be two (2) rounds of questions for all examiners, and further follow up questions if time permits. The Neutral Chair is responsible to ensure that examiners ask clear and succinct questions and adhere to the exam guidelines as above.

The student should be encouraged to ask for clarification where necessary and to take their time answering. Examiners should only direct their questions to the candidate and not discuss with other examiners during the exam. If the student has understood the question and cannot answer, the examiner should pass to another question and not attempt to extract an answer by prolonged interrogation or by leading the candidate. If an examiner leaves the room, the exam must be stopped until they return.

Evaluation of FOS examination

After the examination is complete, the student and supervisor will leave the room. The Neutral Chair will explain the procedures of evaluation. There will first be an anonymous straw vote that provides a framework to initiate discussion. The goal of the discussion is to reach a consensus recommendation; however unanimous decisions are not required (it takes at least 2 negative votes to fail). The committee will then complete the Examination report form, which will be delivered by the Neutral Chair to the GSE office. The Neutral Chair will provide committee feedback to the student and supervisor.

Failed FOS Examination

If the student fails, voting committee members and the Neutral Chair must submit a written report within five business days to the Associate Dean – GSE, CSM, outlining the reasons for the negative assessment.

Any student who fails the FOS examination will be given an opportunity to retake the failed oral examination (not before two (2) months but less than six (6) months after the first attempt). A student has the option to transfer to the MSc program only after the first failure. A student will be required to withdraw from the program upon a second failure of the FOS exam.

Appeal of a Failed FOS Examination

In the case of a failed examination, students have the right to appeal. Students must appeal directly to the FGS (see the Graduate Calendar – section O.2 Appeals Against Faculty of Graduate Studies Rulings).).

Successful FOS Examination

Once the student has successfully passed the FOS exam, the Graduate Program Administrator will prepare an Admission to Candidacy form which must be signed by the student, supervisor and GPD. The student is not officially considered a PhD candidate until this form is submitted to Graduate Studies and an entry indicating successful completion of Candidacy has been recorded on their transcript.

Extension to FOS Examination Deadline

In order to request an extension to the FOS exam deadline, an extension request form (obtained from the Graduate Program Administrator) should be completed with an explanation of the reasons for the delay, signed by both the student and supervisor. The completed and signed form should be submitted to the Graduate Program Administrator who will forward it to the GPD and the Associate Dean – GSE, CSM for approval.

Students who fail to complete the candidacy requirements by the twenty-eighth (28^{th}) month of their program and do not submit an extension request may be required to withdraw.

Candidacy Process Timeline Chart

Figures 4 and 5 provide a visual timeline for the Candidacy Process. They are intended to be used as a guide.

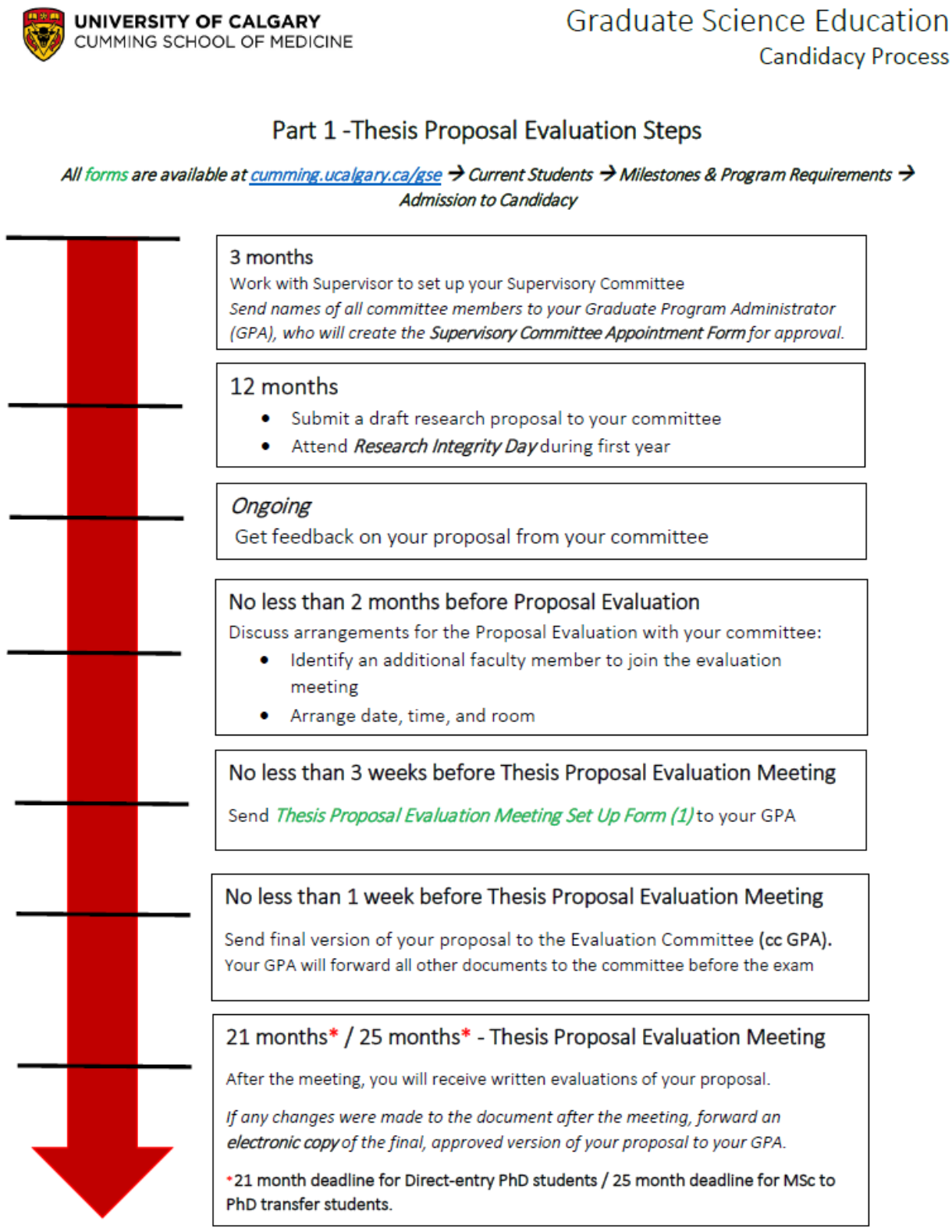

Figure 4. Part 1 Candidacy Guide

Part 2 - Field of Study Exam Steps

Before you can proceed to the Field of Study Exam, the following components must be completed:

- Research Integrity Day
- Successful Thesis Proposal Evaluation Meeting
- Coursework

21 months* / 25 months*

Arrange a meeting with your committee to determine topics for the Field of Study Exam. The following arrangements should also be discussed:

- Identify an examiner **internal** to the program
- Identify an examiner **external** to the program
- Arrange date, time, and room (GSE conference room may be available – talk to your GPA)

Submit approved *Field of Study (FOS) Preparation Form (2)* to GPA

***21 month deadline for Direct-entry PhD students / 25 months for MSc to PhD transfer students.**

4 weeks before exam date

Send *Field of Study Exam Set-Up form (3)* to your GPA

24 months* / 28 months* - Field of Study Exam

Your GPA will forward your exam topics and all documents to the committee before the exam.

24 hours after Field of Study Exam

Submit signed *Recommendation for Admission to Candidacy form* to your GPA.

This form will be forwarded to you after you successfully complete your Field of Study exam)

Congratulations! You're a PhD Candidate!

Figure 5. Part 2 Candidacy Guide

Defenses (Doctoral & Masters)

Permission to Write

Prior to scheduling the defense, MSc and PhD, students must meet with their Supervisory Committee and discuss the data to be included in the thesis. The Committee may provide approval, or conditional approval where the completion of a small number of clearly specified experiments is required, for the student to write their thesis and schedule the thesis defense examination. Normally, the student must receive this approval, to be recorded in the minutes of their meeting and submitted to the Graduate Program Administrator, before the Notice of Doctoral or Master's Thesis Examination is approved. Any "student who has successfully completed all FGS and program requirements has the right to submit and defend a thesis even if doing so may be contrary to the advice of the Supervisor Committee" (University of Calgary, 2016-b).

Once the research is complete the student needs to request and complete the Permission to Write Form from the Supervisory Committee. This form needs to be submitted to your Graduate Program Administrator for your records. "Permission to write" indicates that the student has completed the body of work that the committee believes is sufficient for a thesis. It is not necessarily an endorsement of all aspects of the thesis research. The decision to pass or fail a thesis is made by each examiner, including the supervisory committee members, at the Defense Examination.

Thesis Preparation

For instructions on preparing your thesis and submitting it, refer to the Thesis Section on the FGS website. Thesis templates can also be found there.

CHS Guidelines for Manuscript Based Thesis provide distinct guidelines for MDCH students who are considering completing a manuscript based thesis. These are in addition to the FGS requirements.

Requirements for Thesis Defense

The oral defense of a thesis is an FGS requirement. Review the Examinations section of the FGS website for full details on the policy and rules for examinations.

To set up the thesis defense the following need to be completed:

- Research Integrity Day attended
- Complete Courses required for degree, meeting the minimum 3.0 GPA requirement
- PhD – Successful Admission to Candidacy
- Supervisor/Committee indication that thesis is ready to defend.
- Submission of Request to Set Up Thesis Defense Form (minimum of six (6) weeks (MSc) or eight (8) weeks (PhD) prior to proposed defense date)

If any of the above are not complete the student will not be approved to move forward to defense.

- MSc Deadline to submit the Request to Set Up Thesis Defense Form is six (6) weeks prior to the oral defense date and is a firm deadline.
- PhD Deadline to submit the Request to Set Up Thesis Defense Form is eight (8) weeks prior to the oral defense date and is a firm deadline

Thesis Examination Committees

Supervisor Responsibility

The Supervisor, with the assistance of the Graduate Program Administrator, is responsible for ensuring that all steps necessary for arranging the thesis oral examination are completed.

Student Responsibility

The Student must ensure that the MSc or PhD thesis is in the hands of all examiners, both local and external, at least three (3) weeks prior to the proposed date of the oral examination. The Graduate Program Administrator will forward the "Examiners' Report on Thesis" form and further instructions to all examiners.

Thesis exams start on the date when the thesis is due to be handed out to the examiners. After this date, the exam cannot be changed unless there is an overriding emergency. The committee is reminded that examining committee members should not discuss the exam prior to the oral defense.

The Neutral Chair

The thesis oral examination is chaired by the GPD, or delegate, assigned by the Graduate Program Administrator. The chair reports to the results to the student and Dean by completing the Report of Thesis Oral Defense given to the Graduate Program Administrator once the exam is complete.

Composition of Master's Thesis Examination Committee

The Master's Thesis Examination Committee shall consist of the student's Supervisory Committee and at least one (1) other examiner. This examiner should be external to the student's program. The composition of the committee must be approved by the Dean of FGS, upon the recommendation of the GPD.

Composition of Doctoral Thesis Examination Committee

The Doctoral Thesis Examination Committee shall consist of the student's Supervisory Committee and at least two (2) other examiners, one (1) of whom shall be external to the student's program but internal to the University of Calgary. The other additional committee member, the External Examiner, shall be external to the University. The choice of the additional examiners is made in consultation between the student, the supervisor and the supervisory committee. The composition of the thesis examination committee must be approved by the Dean (FGS) upon the recommendation of the GPD. FGS may appoint a Dean's representative to observe the examination to ensure that the rules of the exam are followed and that the student is treated fairly.

Persons who are not Board appointees of the UofC may be approved to serve on a Thesis Examination Committee. A recommendation by the GPD for such an appointment must be accompanied by a CV.

Choosing an External Examiner

The External Examiner must meet certain criteria, as follows:

(a) Has a well-established research reputation
(b) Has particular expertise in the area of the student's research
(c) Has experience in evaluating doctoral theses
(d) Has not had a personal or professional relationship with the student, the supervisor, or any member of the supervisory committee

(e) Has not worked with the student, the supervisor, or any member of the supervisory committee, e.g., has not in any way been involved in publications, has not shared in any grants, etc.
(f) Has not been resident in or otherwise closely associated with the department or graduate program.

Request for Approval of External Examiners

The External Examiner must be recommended to the Dean (FGS) by the GPD at least eight (8) weeks before the proposed date of the examination. The recommendation is made on a Request for Approval of External Examiner form generated by the Graduate Program Administrator, and must be accompanied by a CV. An approved External Examiner is invited in writing by the Dean, FGS, to participate in the examination.

External Examiner – Funding

Any arrangements to cover Examiner's travel and accommodation expenses are made by the Supervisor.

Examiners in Absentia

Only two (2) examiners will be authorized to attend from a distance. This can be done either through teleconference or videoconference. It is the responsibility of the student and supervisor to arrange satisfactory connections and backup arrangements when using videoconferencing. It is highly recommended that the connection be tested prior to the examination date.

If the examination is being held in the Graduate Science Education Boardroom (HSC G344) telephone numbers need to be provided to the Graduate Program Administrator and neutral chair to contact the distant examiners.

Notice of Doctoral/Master's Thesis Oral Examination

The Notice of Doctoral or Master's Thesis Oral Examination (NOE) is the mechanism for approval of the Examination Committee. The NOE, indicating the title of the thesis, the time and place of examination, and the names of the recommended examiners, endorsed by the GPD must be received in the FGS office at least four (4) weeks prior to the time of examination. The committee will not be approved earlier than three (3) months before the planned examination date.

The NOE includes a confirmation that the student has cleared all departmental requirements.

The student and/or supervisor should provide the Graduate Program Administrator a completed "Request to Set-Up Thesis Defense form" a minimum if six (6) weeks prior to the oral defense date for MSc and eight (8) weeks for PhD.

Posting the NOE

The NOE Form bearing the name of the student (not the UCID), the name, but not the signatures, of the Supervisor, GPD and the Dean (FGS), must be publicly posted at least two (2) weeks before the date of examination. Copies of the NOE will be sent by the Graduate Program Administrator to the student and the members of the Examination Committee along with further instructions three (3) weeks prior to the oral defense date.

Attendance at Thesis Oral Examinations

Thesis examinations are open. Only the examiners may question the student. After the examination, everyone will leave the room except the Neutral Chair, the examining committee and, if present, the Department/Program Head and the Dean of FGS or the Dean's Representative. The examiners' deliberations are private and confidential.

Withholds

A withhold denies the student access to certain services through the Office of the Registrar (e.g., obtaining transcripts, making changes to current registration, registering for courses, convocation clearance). A withhold may result in denied access to other services offered by the UofC. Students on withhold will not be considered for FGS support or program-specific awards.

A "withhold" may be placed on students for the following reasons:

1) Failure to submit an Annual Progress Report.
2) Failure to submit an approved Research Proposal on time. See below for administrative procedures.
3) Failure to take the Candidacy Exam by the appropriate deadline.
4) Failure to pay tuition and general fees by deadlines.

A withhold is removed when the reason for the hold has been satisfied or the appropriate extension requests have been approved.

A student on withhold for > 1year may be withdrawn from the graduate program on the basis of "unsatisfactory progress"

Convocation/Graduation

Students should apply for convocation prior to their Oral Defense. Typically, the application is due at the beginning of the term in which the Convocation Ceremony will occur and can be submitted through the MyUofC Student Centre. Review the criteria to be cleared for convocation to make sure deadlines are not missed.

Part of the process to be cleared for convocation is the completion of the Notice of Completion form for both thesis and course based students.

For course based students this will be completed by the Graduate Program Administrator after final grades have been submitted for the last course taken. Please ensure that the Graduate Program Administrator is notified prior to the end of the term in which the final course is completed to ensure that deadlines are not missed.

Vacation

Students are entitled to two weeks of annual vacation, not including statutory holidays or days the University is scheduled to be closed.

It is strongly recommended that students discuss with the supervisor the needs as it relates to lab work and studying for courses, preparing for candidacy and writing the thesis to ensure that both the student and supervisor's expectations are met.

Absence from Program

The Leave of Absence (LOA) Policy exists to assist students who are unable to continue their programs for a period of time. Reasons for requiring a leave normally include bereavement, care giving, medical, military service and parental leave. Students are advised to discuss the need for a leave with their supervisors, Graduate Program Administrator, GPD and/or Supervisory Committee members.

Preparing the Application for Leave of Absence

In consultation with the supervisor, the Application for LOA form is completed by the student, and signed by both the student and supervisor. The application should also receive approval from the GPD before it is submitted to FGS for final approval. Wherever possible, application should be made as far as possible in advance of the anticipated leave or as soon as possible after commencement of the leave. While it is often difficult to anticipate the need for a leave, wherever possible it is helpful if the commencement and termination of the leave coincides with the beginning of a term or registration year.

Note that it is the student's responsibility to ensure that the proposed leave is compatible with the regulations of any granting agency from which funding would normally be received during the leave period and that such agencies are informed of the proposed leave. Students on student loan programs should clarify the consequences that such a leave may have on their repayment status.

International students are advised to consult with immigration authorities regarding their immigration status during a proposed leave. Students whose leave overlaps their annual registration date will be required to submit an Annual Progress Report to the GPD by the appropriate deadline date. The report is used for assessment of fees.

In the rare event that a student and supervisor have difficulty agreeing to the leave arrangements, students should consult first with the GPD and then, if necessary, with FGS.

Employment While Registered in Graduate Programs

Students can take Graduate Assistant Teaching (GAT) positions with the approval of their supervisors.

All other employment should be discussed with the supervisor to ensure that it does not cause conflicts with expectations for finishing the research work and thesis.

Withdrawals

Students may withdraw from their program at any time for any reason by completing the withdrawal form found on the Faculty of Graduate Studies website (grad.ucalgary.ca/current/managing-my-program/withdrawal). It is their responsibility to ensure that all fees are paid up to date at the time of withdrawal.

Students who have voluntarily withdrawn may request re-admission at any time after the withdrawal.

"Students who have been required to withdraw may not apply to another graduate program at the University of Calgary until a year after the final decision has been made." (University of Calgary, 2016-c)

In exceptional circumstances, which are unforeseen and beyond the student's control, a student will request a withdrawal with the objective of reapplying at a later date to defend their graduate thesis.

If the student is registered at another postsecondary institution since the withdrawal from the program, official transcripts must be submitted.

The student's University of Calgary transcript will permanently reflect the withdrawal from the graduate program and the date the withdrawal occurred.

Readmission

Students who have been withdrawn from program are required to apply for readmission to the graduate program. This will include any official transcripts from academic work pursued during the time they were away.

Readmission is at the discretion of the GPD.

To participate in University activities a student's registration must be active. This includes laboratory work, attendance in courses, teaching and receiving paid support. (University of Calgary, 2016-a)

Professional Development

The GSE Office supports and coordinates a Professional Development program (PDP) from students in the CSM. The purpose of the PDP is to establish an organized and effective framework of professional development for our students that is recognized by the Faculty. This involves developing competencies within our graduate programs that are important to becoming a successful researcher and to support excellence in health research. It provides strategies for trainees to achieve academic and career success.

Competencies

The CSM has defined a set of competencies or skills that are critical for a student to be a successful researcher. These competencies are collaborate, generate scientific knowledge, teach/mentor, communicate, and lead/manage.

The competencies can be obtained by a variety of means including daily research, course work, research and journal club presentations, conference presentations and workshops offered in the PDP.

The degree to which these competencies have been acquired can be at three levels:

1. Awareness
2. Early Skill Development
3. Demonstrating Excellence

Collaborate

A researcher needs to collaborate with a variety of people and organizations.

This includes but is not limited to the following:

- Ability to develop and maintain cooperative networks and working relationships with supervisors, colleagues, and peers within the institution and the wider research community
- Ability to facilitate group/teamwork
- Ability to work as a team member in a collaborative environment
- Ability to identify challenges and opportunities in partnership development and collaboration

Communicate

As a researcher students are expected to be able to communicate ideas through various media and to numerous different groups.

Being a competent communicator consists of, but is not limited to, the following:

- Ability to summarize information relevant to a specific scientific question/topic
- Ability to communicate effectively, concisely and correctly in written, spoken and visual forms to a variety of audiences using a wide range of media

- Interpersonal skills including listening, asserting, influencing, persuading, empathizing, and exercising sensitivity and diplomacy
- Ability to recognize the importance of other aspects of communication including body language and other forms of non-verbal communication
- Ability to listen to and receive feedback from peers, supervisors, and junior researchers
- Ability to give constructive feedback and respond perceptively to others
- Knowledge of different audiences and ability to adapt to effectively disseminate research results, obtain funding, and/or generate collaborative interest in research, verbal, written or visual
- Knowledge dissemination

Generate Scientific Knowledge

A researcher is expected to be able to generate new knowledge.

This consists of but is not limited to the following:

- Ability to perform research which is novel and publishable
- Ability to apply relevant research methods
- Ability to develop new/original methodologies
- Ability to apply conceptual knowledge to experimental design and data analysis
- Ability to evaluate hypotheses and data critically and interpret data validity, including using appropriate qualitative and quantitative approaches, including those that are already published
- Ability to generate multiple solutions and demonstrate divergent thinking
- Ability to reach and defend independent conclusions, and support a position or viewpoint with argumentation and logic
- Responsible conduct of research and knowledge of all policies governing work with human subjects, animals, hazardous materials, as appropriate

Lead/Manage

A researcher is expected to be able to lead research and manage time, group and various other aspects related to the research.

This includes but is not limited to the following:

- Demonstrates decision making skills including but not limited to analytical and critical thinking and problem solving/trouble shooting
- Knowledge of how to implement and manage all phases of complex research projects and follow them through to completion (manage project timelines and resources)
- Ability to prioritize tasks effectively, and identify needed resources
- Demonstrate an understanding and a willingness to build interpersonal skills
- Experiment and apply interpersonal skills through team building, consensus building, negotiation and conflict management
- Develop and maintain cooperative networks and working relationships with supervisors, colleagues, and peers within the institution and the wider research community
- Be aware of all institutional polices governing relations

Teach/Mentor

A researcher is expected to be able to teach and/or mentor others.

This happens in a variety of ways as indicated but not limited to the following:

- Demonstrates teaching skills through class presentations and seminars
- Demonstrates mentoring skills through collaboration with other researchers (other students - grad or undergrad -, PDFs, RAs, PIs)
- Provides clear, explicit instructions that facilitate understanding and learning by others
- Ability to inspire, motivate, mentor and develop others
- Ability to understand the importance of identifying the learning outcomes, first and foremost, to facilitate the selection of appropriate content (what to teach/learn), as well as the most effective teaching tools (how to teach/facilitate learning)
- Adapt instructional and mentoring activities to address different learning styles, recognizing different motivations, backgrounds and experiences, to address learning needs in a systematic fashion
- Ability to influence, motivate, mentor, guide, and enable others to contribute to the effectiveness and success of an organization of which they are members (Lab, industry, field, society, etc.)
- Ability to manage others, including recognizing and rewarding the contributions of others

Themes and Topics

The program is broken down into three themes:

1. Academic Success: Practical skills and information for the successful completion of a graduate degree

   As a student, professional development is important for career progression and goals. Academic success provides practical skills and information about the successful completion of a graduate degree.

   Seminars & Workshop topics will include, but are not limited to:

   - Plagiarism
   - Copyright
   - Writing a Thesis Proposal
   - Intellectual Property
   - Preparing for Candidacy Exams

2. Professional Effectiveness: Provides students the opportunity to develop the skills necessary for communication, team building, management and problem solving

   Provides students the opportunity to develop skills necessary for communication, team building, management and problem solving.

   Seminars and Workshops will address various aspects of professional effectiveness. Topics include:

- Transferable skills
- Professional relationships
- Alternatives to Research Careers

Students need a broad skill set for both graduate studies and career success. One of the primary goals of our professional development program is to enable the trainee to identify and enhance the skills that are required for both personal and professional effectiveness. A wide range of competencies is crucial for success in any career path, developing proficiencies in these "soft skill" areas, will enhance the trainee's ability to fulfill their career goals.

3. Career Development: Practical opportunities to assess personal strengths, interests and goals to identify potential career options and develop the skills to prepare for these opportunities.

   These seminars will give a glimpse into the lives of professionals who have completed their degrees in similar areas of study to students in the CSM.

It is never too early to begin thinking about future career paths. Even though goals and aspirations may change over the course of a graduate program, it is critical to assess strengths and areas of improvement and identify potential interests. This facilitates the identification and development of skills that will be beneficial in future endeavours whether in an academic environment, or in non-academic science careers.

Schedule of Sessions

The workshops listed in table 4 are subject to change without notice.

Table 4. Proposed Professional Development Workshops for 2016-17

PROPOSED 2016 – 17 PROFESSIONAL DEVELOPMENT WORKSHOPS

DATE &TIME	Workshop Title & Facilitator
SEPTEMBER 7, 2016 – 8:30-11:30AM – G500	GSE New Student Orientation (Various)
SEPTEMBER 8, 2016 – 8:30-12PM – MAIN CAMPUS	International Student Orientation
SEPTEMBER 9, 2016 – ALL DAY – MAIN CAMPUS	FGS New Student Orientation (FGS)
SEPTEMBER 30, 2016 – 1:00-2:300 – HS G639	Academic Integrity & Using Sources Effectively
OCTOBER 21, 2016 – 1-2PM – THEATRE ONE	Candidacy Process
OCTOBER 21, 2016 – 2:30-4PM – THEATRE ONE	Academic ½ Day (Tara Beattie, Sarah Childs)
NOVEMBER 18 OR 25 – 2:30-4PM – HS G639	Mindfulness of Stress Management (Alex Klassen, Wellness Center)
NOVEMBER 25 2016 – 2-4PM – HS G639	StrengthsQuest (Student Support Services)
DECEMBER 2, 2016 – 1-4PM – HS G639	Understanding Canadian Business Culture & Informational Interviews (Julie Brown)
JANUARY 27, 2017 – 2:30-4PM – HS G750	Life Balance (Wellness Centre)
FEBRUARY 17, 2017 – 1-4PM – HS G639	Using Social Media to Gain Employment Opportunities & Responding to the Job Posting (Julie Brown & Katherine, GSA)

MARCH 3, 2017 – 2-4PM – HS G639	Preparing to Defend your Thesis: Strategies for Managing your Anxiety (Laura Schultz, Wellness Center)
MARCH 24, 2017 – 2-4PM – HS G639	Emotional Intelligence (Zenobia Ali)
APRIL 21, 2017 – 2-4PM – TBA	Negotiating your Dream Job (Julie Brown, GSA)
TBD	Candidacy Workshop
TBD	Resume/CV/Cover Letter Writing?
TBD	Interview Strategies
JUNE 9, 2017 – 2-4PM – HS G750	Eat Sleep Play: Your Best Physical Self (Mandy Little, Wellness Centre)

Newsletter topics will mirror the workshops happening in each given month.

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Appendix A: GSE Office Contact List

Associate Dean Dr. Tara Beattie	T: 403.210.8651 (medgse@ucalgary.ca)	Biochemistry & Molecular Biology (BMB | MDBC) Administrator: Marion Mildenberger GPD: Dr. Sarah Childs	HSC G345B T: 403.220.8606 bmbgrad@ucalgary.ca
Assistant Dean Open		Biomedical Technology (MBT | MDBT) Administrator: Sabrina Anderson GPD: Dr. Randy Johnston	HSC G341B T: 403.210.6689 mbtgrad@ucalgary.ca
Assistant to the Associate Dean | Student & Scholarship Liaison Diana Law	T: 403.220.5712 medgse@ucalgary.ca HSC G341A	Cardiovascular & Respiratory Sciences (CVR | MDCV) Administrator: Sabrina Anderson GPD: Dr. Andrew Braun	HSC G341B T: 403.210.6689 cvrgrad@ucalgary.ca
GSE Office Manager Christine Schill	T: 403.220.3650 cmschill@ucalgary.ca	Community Health Sciences (CHS | MDCH) Administrator: Darlene Sibilleau GPD: Elizabeth Oddone Paolucci	HSC G347C T: 403.210.7051 chsgrad@ucalgary.ca
Awards & Project Appointment Administrator Emma Tonye	T: 403.210.6687 gseproj@ucalgary.ca	Gastrointestinal Sciences (GI | MDGI) Administrator: Marion Mildenberger GPD: Dr. Donna-Marie McCafferty	HSC G345B T: 403.220.8606 gigrad@ucalgary.ca
Professional Development Administrative Coordinator Sabrina Anderson	T: 403.210.6689 proskills@ucalgary.ca	Immunology (IM | MDIM) Administrator: Marion Mildenberger GPD: Dr. Donna-Marie McCafferty	HSC G345B T: 403.220.8606 imgrad@ucalgary.ca
		Leaders in Medicine (LIM) Administrator: Michelle Selman Director: Dr. Paul Beck	HSC G341C T: 403.210.9572 mdgrad@ucalgary.ca
		Medical Science (MDSC) Administrator: Kiran Pandher GPD: Dr. Paul Mains	HSC G347A T: 403.220.6582 medgrad@ucalgary.ca
		Microbiology & Infectious Diseases (MID | MDMI) Administrator: Marion Mildenberger GPD: Dr. Donna-Marie McCafferty	HSC G345B T: 402.220.8606 midgrad@ucalgary.ca
		Neuroscience (MDNS) Administrator: Lesley Towill GPDs: Drs. Richard Wilson &	HSC G345A T: 403.220.2558 neurosci@ucalgary.ca
		Pathologist's Assistant (MPath | MDPA) Administrator: Sabrina Anderson GPDs: Drs. Amy Bromley & Bill Gorday	HSC G341B T: 403.210.6689 mpath@ucalgary.ca
			HSC G345C T: 403.210.7051

Appendix B: MDBC Program Specific Policies

Program Description

Graduate studies in the Biochemistry & Molecular Biology program at the University of Calgary will expose you to exciting and leading edge research in a number of different research areas, including molecular, cellular and developmental biology, biochemistry, genetics, bioinformatics and cancer and clinical research.

Graduate students can enroll in either the traditional Biochemistry and Molecular Biology stream or in the **Bioinformatics Specialization**, as part of the Biochemistry & Molecular Biology Graduate Program. The Bioinformatics program provides students with advanced training in the development of computational approaches for understanding large-scale biomedical data.

Course Requirements

In almost all cases, PhD students will be required to take at least three graduate level courses, and MSc students will be required to take at least two courses, although this can be modified by the Supervisory Committee.

All BMB students are required to take **one** of the two BMB "core" courses (MDSC 721 Biochemistry and Molecular Biology, MDSC 641.01 Advanced Genetics) at their first opportunity. Students in the Bioinformatics Specialization must also take MDSC 679 as part of their course requirements.

Other courses required for each student will be selected by the student in consultation with the supervisor and/or supervisory committee, based upon academic background and proposed general area of research. The form entitled "GSE Course Requirements and Approval" should be used as an aid.

Other Requirements

All students in the MDBC program are required to:

- Participate in and present at least once per academic year at their research institute's seminar series.
- Participate in and present at least once per academic year at a journal club related to their research
- Complete an Annual Progress Report each May, which is reviewed by their Supervisor and the Program Director

Stipends

Supervisors agree to maintain minimum and maximum stipends for their graduate students in the BMB program as described: http://www.ucalgary.ca/bmb/financialsupport, until the thesis has been submitted to examiners. Payment of stipends following submission of the thesis or during program extensions is not obligatory but is negotiable between the student and supervisor.

Paid vacation time, time to prepare for the PhD candidacy exam, and time to write the thesis, are negotiable between student and supervisor. Typically, paid time away from the lab includes 2- 3 weeks per year for vacation, 1 month for the candidacy exam, and 1-2 months for thesis writing. These are guidelines only. Students must understand that stipends are paid from public funds, whether they are

operating grants or studentship awards, and that a certain minimum amount of time spent on research in the lab is expected. At the same time, supervisors understand that students are trainees - not employees - and need time to study for courses and exams, attend seminars, retreats and conferences, and to read, think and talk about research.

Awards

BMB First Authored Research Publication Award

This award has been created in recognition of research achievements made by BMB graduate students. There is a limit of 2 awards per person for the duration of their program. Students should submit the Award for 1st-Authored Research Papers application form, along with the acceptance letter and/or the publication information to the GRADUATE PROGRAM ADMINISTRATOR for consideration.

BMB Entrance Award

Students admitted to the program *may* receive a BMB Entrance Award (subject to available funding). Entrance Awards are paid out during the second month of the student's program. MSc students will automatically receive this award in their first year. PhD students will automatically receive this award in their first and second years. If a student transfers from the MSc to the PhD program, they will be awarded the second installment of the award. **Entrance Awards will be reduced by any amount that a stipend is above the BMB minimum stipend level**.

Appendix C: MDBT Program Specific Requirements

Program Description:

The Master of Biomedical Technology (MBT) program exposes students to a broad range of recent concepts and cutting-edge technologies, providing them with both the skills, knowledge, and experience that they need for successful careers in the Pharmaceutical and Biotechnology industries. In today's workplace where working in teams across disciplines is the key for success and employment opportunities, the multi-disciplinary approach embodied within the training program will prepare all students for the flexibility and versatility they will need for future success in business, academia, or government.

The MBT program consists of a comprehensive course package, which ensures the acquisition of a wide range of practical competencies, extensive knowledge of concepts in a variety of biomedical disciplines. MBT graduates are able to access and manipulate the rapidly expanding information on genes, proteins and their structure and functions. Students gain experience in the business development processes of biotechnology companies understanding the market and financial aspects of current companies, as well as the importance of the development of intellectual property.

The MBT Program is a one-year course-based program that combines courses in basic biomedical sciences with training in business aspects such as scientific, market, patent and financial analysis.

MISSION: To provide education and practical experience in basic science disciplines related to biotechnology, and communication and business skills required for successful careers in biotechnology.

MBT/MBA Join Degree Program: Students interested in this option would need to apply and be accepted into both programs. Being accepted into this option makes the program two (2) years where in year one (1) a student completes either the MBT or MBA courses and in year two (2) you complete the program courses not completed in year one. This does require two (2) separate applications with differing requirements.

Course Requirements:

Courses are taken over the full academic year with the Practicum course happening over Spring/Summer. Classes run from 8:00am – 5:00pm Monday – Friday and start in the September Block Week. A student must successfully complete all fall and winter courses before being able to complete the practicum. Below is the required course list:

- MDGE 601: Business Fundamentals (1 unit)
- MDGE 602: Intellectual Property and Licensing (1 unit)
- MDGE 603: Project Management and Corporate Leadership (1 unit)
- MDGE 604: Finances in Biomedical Technology (1 unit)
- MDGE 605: Regulatory Affairs (1 unit)
- MDGE 606: Clinical Trials (1 unit)
- MDGE 607: Communication, Marketing and Sales (1 unit)
- MDGE 608: Business Case Studies (1 unit)
- MDGE 609: Business Integration (1 unit)
- MDSC 673 (Parts A&B): Careers in Biotechnology (3 units)

- MDSC 674.01 (Parts A&B): Integrated Systems Courses (Physiological and Pharmacological Aspects of Therapeutics Development) (6 units)
- MDSC 674.02 (Parts A&B): Integrated Systems Course (Molecular Cellular and Immunological Biotechnology) (6 units)
- MDSC 678 (Parts A&B): Project in Biomedical Technology (3 units)
- MDSC 670 (Parts A&B): Practicum in Biomedical Technology (6 units)

Practicum

Students who participate in their 12-week practicum will receive a $6000 salary which is broken into monthly payments. Half of this salary is paid by the MBT program, and the other half is paid by the practicum company.

The emphasis of the practicum is on commercial application of life sciences. Whether carried out in the university or industrial setting, it differs from basic research in its multidisciplinary approach and commercial focus. The practicum can cover the entire range of activities associated with the product development pipeline. It can take place in the early stages of innovation in the area of patent filing, technology transfer or in the final stages of product sales and marketing. It can be laboratory based in research and development, validation, process development, quality control or business oriented.

Practicum Examples:

Generally, there are six divisions for industry careers. However, these divisions are not exhaustive, but act as a guideline.

- Research & Development: Discovery Research, Bioinformatics, Animal Sciences
- Operations: Process/product development
- Quality: Quality control, Assurance validation
- Clinical Research: Regulatory Affairs, Drug Information, Medical Affairs
- Finance & Administration: Information System, Legal Affairs, Intellectual Property
- Business Development: Marketing, Sales

The components for a successful practicum and job search are covered during the Careers in Biotechnology course (MDSC 673). By the time the students are ready to look for a practicum they have researched and defined their preferred sector, they have developed an effective resume and cover letter and know how to conduct an interview; they have researched potential employers and know how to network.

The practicum search is a combination of student-led initiatives and established connections between the MBT program and local companies and institutes. The practicum search takes place in consultation with the Practicum consultant; it is tailored to the individual's interest and most importantly student driven. We strongly believe that providing the students with skills and support to find their own practicum is far more beneficial than the placement style employed by most of the undergraduate co-op programs.

The Practicum Coordinator is responsible for ensuring the practicum project also meets academic criteria sufficient for the degree.

Awards

There are no awards or scholarship specifically for MBT Students

Appendix D: MDCH

Program Description

The Department of Community Health Sciences represents a diverse set of individual, family, and population health needs in a variety of health, education, and community settings. Students acquire foundation competencies in core areas of research and professional practice in their specialization areas.

Specialization Requirements

Each specialization has unique course requirements. Students must complete the requirements prior to completing their Candidacy Process for PhD Students or defending their Thesis for MSc Students.

Biostatistics

Description: Biostatistics is the application of statistics to biological or medical data. The science of biostatistics includes the design of biological experiments, the collection, summarization, and analysis of data from those experiments; and the interpretation of, and inference from, the results. [1]

"Biostatistics in the public health context consists primarily of developing descriptive statistics describing the overall health and wellbeing of a population. These statistics include such measures as birth, death, and infant death rates; disease incidence and prevalence; and trends of this data over time." [2]

Course Requirements:

Course requirements are listed in Table 5, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 5. Biostatistics Specialization Course Requirements

BIOSTATISTICS SPECIALIZATION COURSE REQUIREMENTS

COURSE TYPE	MSc Course Requirement	PhD Course Requirement
CHS CORE COURSES	MDCH 600 (Fall Block Week): Introduction to Community Health Sciences MDCH 610: Essentials of Biostatistics MDCH 640: Fundamentals of Epidemiology MDCH 681: Health Research Methods	All incoming PhD students are expected to have completed the core courses required at the Master's level. If not, there are two options: • complete the core courses; • request an exemption based on completing equivalent courses at another university.
REQUIRED COURSES FOR SPECIALIZATION	MDCH 611: Models for Health Outcomes (Biostatistics II) MDCH 612: Biostatistics III: Models for Repeated Measures	Four courses appropriate to the advancement of the thesis research topic are required. These are selected in

[1] Definition adapted from http://en.wikipedia.org/wiki/Biostatistics (accessed online August 12 08) and http://www.answers.com/topic/biostatistics (accessed online August 12 08)

2 Description of biostatistics in a public health context from http://www.answers.com/topic/biostatistics (accessed online August 12 08)

	Studies and Time-to-Events Studies MDCH 641: Introduction to Clinical Trials	consultation with Supervisor/Committee and may include the Required Courses for Specialization at the Master's level if not previously completed. NOTE: all course work must be completed prior to the PhD Candidacy Examination.
RECOMMENDED ELECTIVES	One of the following required: MDCH 664: Administrative Data Analysis Methodology MDCH 661: Health Economics I MDCH 740: Advanced Epidemiology MDCH 741: Systematic Reviews and Meta-analysis	As recommended by the student's supervisor / committee.

Community Rehabilitation & Disability Studies

Course-based

Description: The Master of Disability and Community Studies (MDCS) program is a course-based graduate program for working professionals in the field of community rehabilitation and disability studies.

Students are able to work full time and complete their studies in three years, although typically, students complete their degree in 2.5 years. The maximum length of time in program is 6 years. Students will complete a capstone project/paper in their area of interest and present the final document publicly to their student cohort.

Course Requirements

Students in the MDCS program are required to complete a minimum of 36 units, the requirements are further detailed in Table 6.

Table 6. MDCS Course Requirements

MASTER OF DISABILITY AND COMMUNITY STUDIES COURES REQUIREMENTS

COURSE TYPE	Course Numbers and Descriptions
REQUIRED COURSES	• CORE 630 (formerly 603.15) Foundations & Futures of Disability and Community Studies (3 units) • CORE 631 (formerly 603.12) Politics of Inclusion & Exclusion: A study of law, policy and ethics (3 units) • CORE 632 (formerly 603.13) Leadership & Innovation (3 units) • CORE 633 (formerly 603.18) Social Construction & Health Capacity (3 units) • CORE 634 (formerly 603.16) Critical Appraisals in Quantitative Health & Social Science Research (3 units)

	• CORE 676A&B Consultation in Human Services & Systems (6 units) • CORE 624A&B Specialization Theory and Practice: A collaborative inquiry capstone (6 units)
OPTIONS	• 3 unit graduate courses (Options/Electives)

Recommended Electives

CRDS has other graduate courses (on campus & online) that may be of interest to the student's area of specialization.

Thesis Based

Description: Community Rehabilitation and Disability Studies (CRDS) employs the social justice framework to examine the intersection between community and disability, chronic illness, and other marginalizing conditions within a social justice framework. The goal is to generate and influence research theory, leadership, capacity, innovation, policy, and partnerships that advance knowledge, policy and practice. Our graduate programs attract professionals across disciplines and sectors, as well as student pursuing an academic career.

Course Requirements

Course requirements are listed in Table 7, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 7. CRDS Specialization Course Requirements

CRDS SPECIALIZATION COURSE REQUIREMENTS

COURSE TYPE	MSc Required Courses	PhD Required Courses
CHS CORE COURSES	MDCH 600 (Fall Block Week): Introduction to Community Health Sciences	**All incoming PhD students** are expected to have completed MDCH 600 and the required specialization courses at the Master's level (see row below). If not, there are two options: • complete the courses; • request an exemption based on completing equivalent courses at another university
REQUIRED COURSES FOR SPECIALIZATION	CORE 630 (formerly CORE 603.15) Foundations & Futures of Disability & Community Studies 2 half course in CRDS. Minimum of 1 half course in quantitative research methods. Minimum of 1 half course in qualitative research methods.	CORE 730 (formerly CORE 691.36) Pro-Seminar in Disability Studies, Community & Rehabilitation Courses appropriate to the advancement of the thesis research topic are required. These are selected in consultation with

	A minimum (2) two half credit specialization courses determined with Supervisor.	Supervisor/Committee, must be approved by the Graduate Program Director, and may include the Required Courses for Specialization at the Master's level if not previously completed. NOTE: all course work must be completed prior to the PhD Candidacy Examination.

Epidemiology (Clinical & Healthcare included)

Clinical Epidemiology (MSc Only)

Clinical Epidemiology Description: Clinical epidemiology is defined in a variety of ways, including:

- a basic science for clinical medicine;
- the study of determinants and effects of clinical decisions; and
- the study of the variation in the outcome of illness and the reasons for that variation.

In CHS clinical epidemiology is considered a framework for health professionals who wish to move beyond standard critical appraisal skills to:

- skills in research methods, data collection and measurement,
- analysis and optimal interpretation of data,
- a framework for the practice of academic medicine or academic nursing, etc.

Must have a Professional Degree (MD, MScN, etc.) or involvement in clinical practice.

Course Requirements

Course requirements are listed in Table 8, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 8. Clinical Epidemiology Course Requirements

CLINICAL EPIDEMIOLOGY COURSE REQUIREMENTS

COURSE TYPE	MSc Required Courses
CHS CORE COURSES	MDCH 600 (Fall Block Week): Introduction to Community Health Sciences MDCH 610: Essentials of Biostatistics MDCH 640: Fundamentals of Epidemiology MDCH 681: Health Research Methods
REQUIRED COURSES FOR SPECIALIZATION	MDCH 647: Clinical Epidemiology MDCH 641: Introduction to Clinical Trials MDCH 741 Systematic Reviews and Meta-analysis MDCH 611: Biostatistics II: Models for Health Outcomes

ELECTIVES	At least one graduate level course appropriate to the advancement of thesis research topic and agreed upon with supervisor.

Epidemiology (MSc & PhD)

Epidemiology Description: Epidemiology is the study of the distribution of diseases in populations and of factors that influence the occurrence of disease. Epidemiology examines epidemic (excess) and endemic (always present) diseases; it is based on the observation that most diseases do not occur randomly, but are related to environmental and personal characteristics that vary by place, time, and subgroup of the population[2].

Course Requirements

Course requirements are listed in Table 9, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 9. Epidemiology (MSc & PhD) Course Requirements

EPIDEMIOLOGY SPECIALIZATION COURSE REQURIEMENTS

COURSE TYPE	MSc Required Courses	PhD Required Courses
MDCH CORE COURSES	MDCH 600 (Fall Block Week): Introduction to Community Health Sciences MDCH 610: Essentials of Biostatistics MDCH 640: Fundamentals of Epidemiology MDCH 681: Health Research Methods	All incoming PhD students are expected to have completed the core courses required at the Master's level. If not, there are two options: • complete the core courses; • request an exemption based on completing equivalent courses at another university.
REQUIRED COURSES FOR SPECIALIZATION	MDCH 611: Biostatistics II: Models for Health Outcomes MDCH 740: Advanced Epidemiology	Other courses appropriate to the advancement of the thesis research topic. These are selected in consultation with Supervisor/Committee, require Graduate Program Director approval and must include the Required Courses for Specialization at the Master's level if not previously completed. Suggested courses for consideration include: MDCH 741 (Systematic Reviews and Meta-Analysis)

[2] Definition of Epidemiology. McGraw-Hill Professional Sci-Tech Encyclopedia. Accessed on-line November 14, 2007 at http://www.answers.com/topic/epidemiology

		MDCH 664 (Administrative Data Analysis Methodology) MDCH 661 (Health Economics) NOTE: all course work must be completed prior to the PhD Candidacy Examination.
ELECTIVES	At least one graduate level course appropriate to the advancement of thesis research topic and agreed upon with supervisor.	

Healthcare Epidemiology (MSc Only)

Healthcare Epidemiology Description: Healthcare Epidemiology is the study of infection control and prevention, while applying epidemiologic principles and prevention strategies to a wide range of quality-of-care issues. The goal is to maintain the utmost quality of patient care and healthcare worker safety in all healthcare settings[3].

Healthcare Epidemiologists specialize in one of four areas:

- Education
- Surveillance/outbreak management
- Consultation
- Research

Course Requirements

Course requirements are listed in Table 10, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 10. Healthcare Epidemiology Course Requirements

MSC SPECIALIZATION HEALTHCARE EPIDEMIOLOGY

CHS CORE COURSES	MDCH 600 (Fall Block Week): Introduction to Community Health Sciences MDCH 610: Essentials of Biostatistics MDCH 640: Fundamentals of Epidemiology MDCH 681: Health Research Methods
REQUIRED COURSES FOR SPECIALIZATION	MDCH 611: Biostatistics II: Models for Health Outcomes MDCH 649: Epidemiology of Infectious diseases MDCH 643: Research in Healthcare Epidemiology One of the following: MDSC 612 – Medical Microbiology MDSC 613.02 – Pathogenesis of Bacterial diseases

[3] Definition of Healthcare Epidemiology. The Society of Healthcare Epidemiology of America. Accessed on-line November 14, 2007 at http://www.shea-online.org/ *Hospital Epidemiology* has been replaced by *Healthcare Epidemiology* to reflect a broader context of practice.

ELECTIVES	At least one graduate level course appropriate to the advancement of thesis research topic and agreed upon with supervisor.

Health Economics

Description: This program focuses on economic evaluation of interventions and treatments that impact health, both within and outside of health care, as well as evaluation of policy options at the systems level. The goal of health economic evaluation is to provide a framework and a set of techniques to measure and value the resource implications and the outcomes associated with alternative treatments, interventions or policy options, and assist decision makers to allocate scarce health resources to their most beneficial use.

Course Requirements:

Course requirements are listed in Table 11, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 11. Health Economics Course Requirements

HEALTH ECONOMICS COURSE REQUIREMENTS

COURSE TYPE	MSc	PhD
MDCH CORE COURSES	MDCH 600 (formerly MDSC 644 (Fall Block Week)): Introduction to Community Health Sciences MDCH 610 (formerly MDSC 643.01): Biostatistics I: Essentials of Biostatistics MDCH 640 (formerly MDSC 647.01): Fundamentals of Epidemiology MDCH 681 (formerly MDSC 659.02): Health Research Methods	Incoming PhD students may need to complete the core courses required at the Master's level (if they haven't already) and/or other pre-requisite courses from the elective courses selected (see below). Courses will be selected with the supervisor and receive Graduate Program Director approval depending on the student's Master's training and as appropriate to the advancement of the thesis research topic.
REQUIRED COURSES FOR SPECIALIZATION	Two of the following three courses: MDCH 661 Health Economics MDCH 662 Economic Evaluation MDCH 663 Decision Analysis in Health Economic Evaluation	Students are expected to have completed the required courses for the Health Economics specialization at the Master's level (or request an exemption based on equivalent courses at another University). If not, incoming students are expected to complete two of the three courses as required for the

		specialization at the Master's level.
ELECTIVES	At least one graduate elective appropriate to the advancement of thesis research topic and agreed upon with the Supervisor.	At least four electives (including advanced methods courses) appropriate to the advancement of the thesis research topic and agreed upon with the Supervisor. NOTE: All courses must be completed prior to the PhD Candidacy Examination.

Health Services Research

Description: Health services research is a diverse research area, encompassing a broad array of disciplines and methods.

Health services research is a multidisciplinary field of scientific investigation, both basic and applied, that studies how social factors, financing systems, organizational structures and process, health technologies and personal behaviours affect access to health care, the quality and cost of health care, and ultimately our health and well-being[4].

Course Requirements:

Course requirements are listed in Table 12, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 12. Health Services Research Course Requirements

HEALTH SERVICES RESEARCH COURSE REQUIREMENTS

COURES TYPE	**MSc**	**PhD**
MDCH CORE COURSES	MDCH 600 (Fall Block Week): Introduction to Community Health Sciences MDCH 610: Essentials of Biostatistics MDCH 640: Fundamentals of Epidemiology MDCH 681: Health Research Methods	Incoming PhD students may need to complete the core courses required at the Master's level (if they haven't already) and/or other pre-requisite courses from the elective courses selected (see below). Courses will be selected with the supervisor, and must be approved by the Graduate Program Director depending on the student's Master's training and as appropriate to the advancement of the thesis research topic.

[4] Adapted from Academy for Health Services Research and Policy in 2000. Accessed on-line July 2, 2008 : http://www.academyhealth.org/about/whatishsr.htm

REQUIRED COURSES FOR SPECIALIZATION	MDCH 660: Foundations of Health Services Research	Students are expected to have completed the required course for the Health Services Research specialization at the Master's level (or request an exemption based on equivalent courses at another university). In consultation with the supervisor, and with the Graduate Program Director's approval, students are expected to complete at least three advanced methods courses (at the 600 or 700 level) either from the following list: MDCH 611: Biostatistics II: Models for Health Outcomes MDCH 761: Advanced Methods in Health Research MDCH 664: Administrative Data Analysis Methodology MDCH 741: Systematic Reviews and Meta-analysis MDCH 683: Qualitative Health Research or from another department.
ELECTIVES	At least two graduate electives appropriate to the advancement of thesis research topic and agreed upon with the Supervisor.	Electives appropriate to the advancement of thesis research topic and agreed upon with the Supervisor. NOTE: All courses must be completed prior to the PhD Candidacy Examination.

Medical Education

Description: As a result of several social, educational, scientific and resource pressures, medical schools increasingly require staff with degrees in medical education. Professionalism in medical education is enhanced with the MSc degree with more advanced scholars and researchers attaining the PhD degree.

The goal of this specialization is to prepare health providers to be educators and researchers who can work as program administrators, health educators, and health education researchers to address topics relevant to medical education.

Course Requirements:

Course requirements are listed in Table 13, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 13. Medical Education Course Requirements

MEDICAL EDUCATION COURES REQUIREMENTS

COURSE TYPE	MSc	PhD
MDCH CORE COURSES	MDCH 600: Introduction to Community Health Sciences	MDCH 600: Introduction to Community Health Sciences
REQUIRED COURSES FOR SPECIALIZATION	MDSC 621: Research Design and Statistics MDCH 623: Teaching Methods in the Medical Sciences MDCH 625: Curriculum Design and Evaluation in the Medical Sciences MDCH 627: Medical Education Measurement	All incoming PhD students are expected to have completed the specialization courses required at the Master's level. If not, there are two options: • complete three specialization courses; • request an exemption from taking the required courses based on completing equivalent courses at another university.
ELECTIVES	Minimum of one graduate-level course appropriate to the advancement of thesis research topic and agreed upon with supervisor.	Minimum of one graduate-level course appropriate to the advancement of thesis research topic and agreed upon with supervisor.

Population/Public Health

Description: Population and public health definitions are adopted from the Canadian Institutes of Health Research, Institute of Population and Public Health (IPPH)[5]

IPPH supports research into (a) the complex interactions (biological, social, cultural, environmental) that determine the health of individuals, communities, and global populations, and (b) the application of that knowledge to improve the health of both populations and individuals.

Population health "refers to a broad trans-disciplinary approach to understanding the fundamental determinants of human health, especially the interaction of physical and social environments with genetic predispositions, over the life-course, at both individual and community levels, in whole societies." Population health is fundamentally concerned with shifting the distribution of risk conditions and reducing inequity in this distribution.

Public health is described as the science and art of promoting health, preventing disease, prolonging life and improving quality of life through the organized efforts of society[6]. It primarily distinguishes itself

[5] Canadian Institutes of Health Research: Institute of Population and Public Health (IPPH) accessed August 20, 2008 on-line at http://www.cihr-irsc.gc.ca/e/12274.html

[6] Last J. (Ed). *A dictionary of epidemiology*: 4th edition. Toronto: Oxford University Press, 2001.

from publicly funded health care at the clinical (one-on-one) level by focusing on the health of the population as a whole. Core public health functions include[7]:

- population health assessment,
- health promotion,
- disease and injury prevention,
- health protection,
- health surveillance, and
- emergency preparedness

Essentially, the science (research content and methods) of public and population health are similar, but public health has traditions and standards of practice associated with it. Many people use the terms interchangeably.

The goal of this specialization is to train transdisciplinary researchers who can work with policy-makers, program administrators and public health professionals to identify and study important social and physical determinants of health at the population level in Canada or globally, and who have the knowledge base and/or practical skills to design, carry out, and evaluate interventions to improve population health.

Course Requirements:

Course requirements are listed in Table 14, exemptions must be requested at admission and require a letter from the supervisor with rational for the exemption request.

Table 14. Population/Public Health Course Requirement

POPULATION/PUBIC HEALTH COURSE REQUIREMENTS

COURSE TYPE	MSc	PhD
CHS CORE COURSES	MDCH 600: (Fall Block Week): Introduction to Community Health Sciences MDCH 610: Essentials of Biostatistics MDCH 640: Fundamentals of Epidemiology MDCH 681: Health Research Methods	All incoming PhD students are expected to have completed the core courses required at the Master's level. If not, there are two options: • complete the core courses; • request an exemption based on completing equivalent courses at another university.
REQUIRED SPECIALIZATION COURSES	MDCH 680: Foundations of Population/Public Health	Four courses appropriate to the advancement of the thesis research topic are required. These are selected in consultation with Supervisor/Committee and may include the Required Courses

[7] Frank J. The future of public health in Canada: developing a Public Health System for the 21st century. CIHR: Institute of Population and Public Health, 2003 (downloaded from http://www.cihr-irsc.gc.ca/e/19573.html.)

		for Specialization at the Master's level if not previously completed. NOTE: all course work must be completed prior to the PhD Candidacy Examination.
ELECTIVES	Minimum of two graduate-level courses appropriate to the advancement of thesis research topic and agreed upon with supervisor.	

Seminar Requirements

Weekly IPH Seminar attendance is highly recommended and in some cases may be required. Attendance at Journal Clubs for your specialization are also highly recommended.

CHS Candidacy Process

Purpose

"A long-standing, often dreaded element of doctoral education" is the milestone known as the qualifying examination - also known as the comprehensive or candidacy examination. In some cases, these examinations are "summative and backward looking, serving to assess whether a student has acquired sufficient content knowledge."

"In other cases they look forward and provide a roadmap for work to come, focusing on a student's ability to:

- Generate new insights,
- Ask questions,
- Make connections, and
- Focus on a special area of expertise."[8]

For many years our examination in CHS took the summative approach – questions from a databank were randomly selected and related to knowledge in biostatistics, epidemiology and health research methods. Given the student had already passed the courses in these areas, a more forward looking approach was adopted that allowed each PhD student to study in-depth the areas that would help prepare him/her for a research career.

The thesis serves another purpose: for the student to demonstrate he/she has the ability to independently carry out a research project.

Preparation Form

- Indicates the student's proposal is complete, the committee agrees on the concept map and readings, mock exam, etc.

[8] Walker GE, Golde CM, Jones L, Bueschel AC & Hutchings P. (2008). The Formation of Scholars: Rethinking Doctoral Education for the Twenty-First Century. The Carnegie Foundation for the Advancement of Teaching. Jossey-Bass, San Francisco; pg 41]

- note that preparation of the concept map occurs simultaneously with development of the thesis proposal

It is important to have clarity on these areas before the student begins preparing for the examination as well as for the examination itself so everyone is "on the same page" and the student has a successful and worthwhile experience. This is one of the only opportunities students get to really learn more in depth about the area they see themselves working in and begin building expertise in that area (not just in the narrow focus of the thesis).

Concept Map

1. define the content boundaries of research knowledge
   - the concept map should define/outline a broad "basket" of research knowledge that supports the thesis topic area - it should not repeat the work being done for the thesis.
   - it establishes a broad context for the student's thesis work in preparation for a career in this area
   - it includes both content mastery as well as critical examination of the research that informs this area
   - each PhD student works with his/her supervisory committee to identify three thematic or sub-areas that define this "basket" of knowledge to provide the context for specific
   - thesis research as well as more broadly for career development.
2. For this content, three competencies are expected:

a) underlying theories and conceptual frameworks
   - What has emerged in these areas that help explain, predict, connect ideas?
   - How is study in these areas framed?
   - Are there elements of different underlying disciplines?

b) methods/methodology (study of methods)
   - What methods are most prevalent in these fields?
   - Are there additional methodologies relevant to study in this area that the thesis does not focus on? Understanding these would provide the student with a broader base with which to move forward in his/her career.
   - What are their strengths and weaknesses?
   - Why have these methods developed (or been favored) and not others?
   - How do the methods contribute to/hinder further understanding?

c) research context; history and philosophy of the underlying science for this research area
   - How did researchers arrive at tools and methods that are currently in use?
   - Historically, who has influenced study in these areas and moved them forward?
   - Are there multiple leaders in development of these fields? Have their ideas been divisive, homogenous or synergistic?
   - Are there specific historic events that changed the direction or focus of studies,
   - e.g. new legislation, new technology developments, political or social factors driving/hindering this research?

Develop a Reading List

The reading list provides a breadth of information to help the student understand and contextualize his/her intended thesis and future career interests.

- While it is comprehensive, it is not intended to include all possible knowledge in the areas; it should have a broader perspective than the thesis bibliography or reference list
- Once the Graduate Program Director and the Supervisory Committee approve the list, the student can finalize retrieving these resources.
- If in the course of studying the reading list the student discovers additional references that are important to these fields, send the additions to the Supervisory Committee and the Graduate Program Director – a maximum of five references can be added to the original list.
- Limiting the number of references on this reading list assists in setting a boundary around the exam expectations. It also contributes to the purpose of this examination, which is for the student to demonstrate his/her ability to critically examine the literature, think creatively/innovatively, articulate responses to the questions, and defend choices made. It is NOT to spend the three weeks searching for more references that are related in some way. The student will have an entire career to develop knowledge and understanding of this content area.

Candidacy Exam Preparation

- Preparation for the exam includes critically reading and understanding the literature that forms the basis of his/her reading list.
- This should not be done in isolation – Supervisory Committee members have expertise in the examination topic areas.

The student should:

- identify concepts, ideas he/she doesn't understand; areas where findings/methods seem to contradict each other
- prepare a short description of what she/he understands
- meet with individual committee members or the committee as a whole to discuss
- use this time to articulate responses to questions and justify responses

Mock Examination

- On the Candidacy Preparation Form the student and his/her supervisory committee can indicate the student will complete one or more mock examinations.
- the supervisory committee assigns a practice question, the student writes a response in a week, committee reads the response and student orally defends it (same process as the candidacy but on a smaller scale)
- this step is not required, but for many students it is recommended – it is a great confidence booster, helps identify areas to improve, gives the student some idea of what to expect

The Candidacy Examination

- the supervisory committee develops three questions which are approved by the Graduate Program Director
- the student answers the questions over a 3-week period

1) the student must remember to pace him/herself; develop a plan for how much time he/she will spend outlining, writing and editing each response
2) leave 2-3 days at the end for final polishing, last minute grammar/spelling checks
3) this examination is not about searching the literature for an answer. Use the resources in the approved reading list.

Candidacy Examination Timeline

Goal of the CHS PhD Candidacy Examination is for the student to demonstrate:

a) Expertise and depth of knowledge in specialization area
b) An ability to think critically as well as synthesize and integrate knowledge
c) Potential to conduct independent research

Planning for the Candidacy Oral examination takes time. Figure 6 is an outlined recommendation of planning for your Candidacy examination.

Figure 7. CHS Candidacy Preparation timeline recommendation

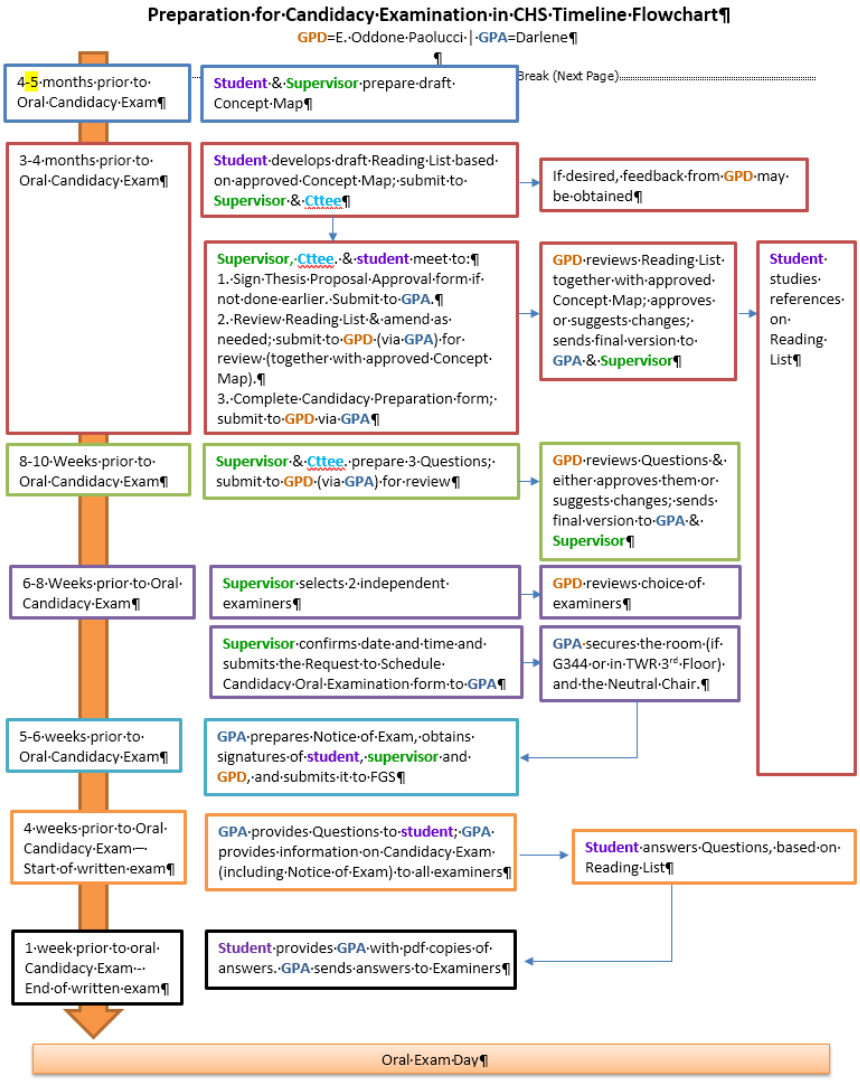

Figure 6. CHS Candidacy Preparation Recommended Timeline

Awards

Pending yearly program funding CHS has the following categories of available funds:

- Travel Awards
- 1st Author Publishing Award
- Student Research Scholarship
- General Support

Check with the GRADUATE PROGRAM ADMINISTRATOR for more details about eligibility for these awards.

Appendix E: MDCV

MDCV Description

The Cardiovascular & Respiratory Sciences graduate program consist of affiliations with multidisciplinary research groups and institutes. Students supervision leading to advanced degrees is offered by the Cardiovascular Group, the Smooth Muscle Research Group (both part of the Libin Cardiovascular Institute of Alberta), and the Airways Inflammation Research Group.

Students have the opportunities to study in multidisciplinary environments where research groups share adjacent laboratory space. The multidisciplinary scheme has proven to facilitate the development of individual research programs, especially with respect to collaborations involving different techniques and model systems. Students are encouraged to take advantage of such collaborations to enhance the scope and quality of their dissertation research.

The Department of Cardiovascular/Respiratory Sciences focuses on providing a training experience that is based on research excellence and quality. Many of our graduates have the skills and abilities to succeed in further academic training, research, technical and professional positions in academic and non-academic settings.

Courses

The minimum course requirement is normally two (2) half courses (6 units) for an MSc, and three (3) half courses (9 units) for a PhD program. At least one (1) course for an MSc program and two (2) courses for a PhD program should be from the list of recommended MDCV graduate courses. The amount of course work is determined by the student's supervisory committee; however, it also must meet the program's minimum requirements:

(a) Students holding a completed BSc degree entering the PhD program are required to successfully complete a minimum of three (3) half courses
(b) Students holding a completed MSc degree in the same area of study entering the PhD program are required to complete a minimum of one (1) half course provided that a minimum of two (2) half courses were completed in their MSc program
(c) Students transferring from the MSc program to the PhD program are required to complete a minimum of one (1) additional half course.
(d) Students holding a completed MSc degree in an unrelated field of studies entering the PhD program are required to complete a minimum of three (3) half courses unless otherwise agreed by the student's supervisory committee.

Requests for Directed Study courses (MDSC 755) submitted to the Associate Dean (GSE) will be evaluated by the MDCV GPD prior to approval. The actual amount of course work is determined by the supervisory committee (see above) and approved by the GPD.

To help manage the program please complete an Academic Plan & Course Approval Form at the first committee meeting

Recommended courses for MDCV

- MDSC 623.01 Pulmonary Mechanics and Gas Exchange
- MDSC 623.02 Respiratory Muscle Physiology and control of Breathing
- MDSC 623.03 Respiratory Science: Basic
- MDSC 623.04 Respiratory Science: Applied
- MDSC 629.01 Cardiovascular Physiology
- MDSC 629.02 Cardiovascular Pathophysiology
- MDSC 629.03 Cardiovascular Pharmacology
- MDSC 631 Muscle Physiology
- MDSC 639.04 Inflammation
- MDSC 751.07 The Physiological Development of the Fetus and Newborn
- MDSC 751.09 Topics In Medical Sciences - Ion Channel Diseases
- MDSC 751.12 Topics In Medical Sciences - Ionic channels of Excitable Membranes
- MDSC 755.43 Smooth Muscle Structure/Function

Seminar/WIP/RIP Requirements

Each student is required to participate in an annual Work-In-Progress research seminar series and also give an annual Journal Club Presentation within their respective Research Group. Conference presentations cannot be substituted for these requirements.

Awards

Subject to available funds the Cardiovascular & Respiratory Sciences program may cover MSc and PhD student program tuition fees, travel or other awards. The amount is determined yearly based on award guidelines.

Scholarship – Tuition Reimbursement

Scholarship payments will be assigned to students in MDCV using the following guidelines:

1. First year MSc students
2. Students in their first year of their PhD program after a transfer from an MSc program
3. Students in the second year of their PhD program
4. Students who receive the recommended minimum level of financial support

Travel Award

Travel reimbursements may be provided pending budgetary obligations and availability of funds. A travel award application will be required and must be accompanied by:

- Confirmation of presentation of either an abstract, poster or speaking presentation at the conference
- Receipts for flight, hotel and meals (if part of the request for reimbursement)
- Copy of the abstract being submitted
- Indication by the supervisor that they endorse the student's planned attendance at the conference (Check box on the application form)

Training Award

Up to $1000 in funds may be available to students attending a training workshop, (such as those offered by Cold Spring Harbor, NIH etc.), or to work in a collaborator's lab outside of Calgary, to cover expenses directly **incurred by the student which were not/will not be reimbursed by the supervisor** (e.g. course registration, air fare, accommodation, meals, cab fare etc.) An expense sheet should be submitted outlining the student incurred expenses (receipts not required).

Students may send a preliminary inquiry to cvrgrad@ucalgary.ca, to see whether funding is still available for the current fiscal year.

MDCV Training Award Application

1st Authored Paper Award

This award has been created in recognition of research achievements made by MDCV students. Each student may receive **one** award per **calendar year**. Award value is $250.

MDCV 1st Authored Research Paper Award Application

Other Awards Specific to MDCV

Three program specific awards are adjudicated through the Cardiovascular & Respiratory Sciences graduate program. The program then forwards a recommendation to the Faculty of Graduate Studies for final approval.

Osten-Victor Graduate Scholarship in Cardiology - internal deadline December 1
Dr. Monica Scarabello Memorial Graduate Research Award (Travel Award) - internal deadline Dec 1
Kertland Family Doctoral Scholarship in Vascular Biology - internal deadline April 1

Appendix F: MDGI | MDIM | MDMI

MDGI Program Description

Research in the Gastrointestinal Sciences graduate program focuses on creating a better understanding of normal digestive function including the mechanisms responsible for dysfunction and the development of disease. Our faculty has a wide range of research interests, including Physiology, Immunology, Immunopharmacology, Microbiology, Nutrition, Parasitology, Pathology, and Epidemiology among others. Our faculty members are part of the Gastrointestinal Research Group (GIRG) - a major centre for studying disorders of the digestive system.

Students in our program are offered opportunities to participate in cutting-edge research and are encouraged to showcase their research at local, national, and international conferences. We offer both Masters and PhD thesis-based degrees. Our students receive an annual stipend from their supervisors. Those with outstanding achievement or potential are also eligible for additional support through scholarships and bursaries.

MDGI Courses

MSc students are required to complete a minimum of 2 half-course equivalents (HCEs), while PhD students are required to complete a minimum of 3 half-course equivalents. When deemed necessary by the Supervisory Committee, additional courses may be required.

Except in exceptional circumstances (and approved by the GPD), all MDGI students are required to take **MDSC 637.01 (Organization and Function of the GI Tract)**. All other course requirements may be selected by the student in consultation with the supervisor and/or supervisory committee, based upon academic background and proposed general area of research. The form entitled “GSE Course Requirements and Approval” should be used as an aid.

MDIM Program Description

The Immunology Graduate Program provides state-of-the-art training in immunological research at the University of Calgary. Our graduate program is associated with the Immunology Research Group (IRG) with members from various basic science and clinical departments across the Cumming School of Medicine and Department of Biological Sciences.

The research of the IRG falls under two core themes:

- ***Development and physiology of cells of the immune system***
- ***Immunological mechanisms in disease and the inflammatory process***

The diversity of research activities within the Immunology graduate program provides our students with an exceptional opportunity to study a specific area in depth while gaining a broad understanding of the discipline.

MDIM Courses

MSc students are required to complete a minimum of 2 half-course equivalents (HCEs), while PhD students are required to complete a minimum of 3 half-course equivalents. When deemed necessary by the Supervisory Committee, additional courses may be required.

Except in exceptional circumstances (and approved by the GPD), all MDIM students are required to take **MDSC 639.02 (Cellular and Molecular Immunology) or MDSC 639.04 (Inflammation)**. All other course requirements may be selected by the student in consultation with the supervisor and/or supervisory committee, based upon academic background and proposed general area of research. The form entitled "GSE Course Requirements and Approval" should be used as an aid.

MDMI Program Description

The Department of Microbiology, Immunology and Infectious Diseases in the Cumming School of Medicine at the University of Calgary aims to promote research and education on infectious and immunological disorders that spans the entire spectrum of 'bench to bedside' investigations. Areas of expertise and interests of the 15 primary members and 50 secondary and adjunct appointees include microbial pathogenesis, microbial genetics, host-pathogen interactions, autoimmune disorders and the development of novel therapeutics. The department operates within a multidisciplinary environment that provides collaborative opportunities among basic and clinician scientists in the Snyder Institute for Chronic Diseases, as well as with faculty members in other disciplines such as members of the Southern Alberta Cancer Research Institute, Institute for Public Health, and the Alberta Children's Hospital Research Institute. The Institute also houses state-of-the-art molecular and imaging facilities that are open to departmental members. Our activities are in complete alignment with the existing strengths identified in the University's and the School's strategic research plans in infection inflammation in a changing environment.

In addition to research, the department is actively engaged in undergraduate as well as postgraduate education in the disciplines of microbiology and immunology. The modular format of our graduate courses provides students with flexibility in their choice of topics of study, as well as promotes interaction among trainees with different research interests.

The Cumming School of Medicine employs a multidisciplinary approach to medical research, education and medical care. This is made possible by Research groups which blend basic and clinical research and provide the Faculty with an excellent opportunity for transferring knowledge from the laboratory to the bedside and the community providing a unique training and mentoring environment for students, postdoctoral associates and faculty.

The Department consists of members from the:
Bacterial Pathogenesis Research Group
Immunology Research Group
Cancer Biology Research Group
Infectious Diseases Research Group

MDMI Courses

MSc students are required to complete a minimum of 2 half-course equivalents (HCEs), while PhD students are required to complete a minimum of 3 half-course equivalents. When deemed necessary by the Supervisory Committee, additional courses may be required.

There are no required courses for the MDMI program. However, when determining the student's coursework, the form entitled "GSE Course Requirements and Approval" should be used as an aid.

Other Requirements for MDGI | MDIM | MDMI Students

All students in the MDGI | MDIM | MDMI program are required to:

- Participate in and present at least once per academic year at their research institute's seminar series.
- Complete an Annual Progress Report each May, which is reviewed by their Supervisor and the Program Director

Although not required, students are strongly encouraged to participate in and present at least once per academic year at a journal club related to their research

Awards

Dr. Joseph Davison Academic Achievement Award (MDGI students only)

This award is presented annually to the student with the highest GRADUATE PROGRAM ADMINISTRATOR in the MDGI required course, MDSC 637.01. No application is required as the program will determine the awardee after final grade submissions have been made.

Dr. Joseph Davison Travel Award (MDGI students only)

This award is presented annually to a student presenting at a prestigious conference or workshop related to the GI field, such as a Gordon Conference, Keystone Meeting, or FASEB Summer Conference. Students presenting at regular annual meetings are not eligible for this award. Applications will be made available by the GRADUATE PROGRAM ADMINISTRATOR each year through an email announcement. If no suitable applications are received, the award will be carried over to the following year.

Henry Koopmans Memorial Entrance Scholarship in Gastrointestinal Nutrition, Metabolism & Inflammation

This award is presented annually to a student who entered their graduate program after January 1st each year. Applications will be made available to students from by the GRADUATE PROGRAM ADMINISTRATOR each year through an email announcement. Students must submit an application and a one-page research summary that identifies the applicability of their research to nutrition, metabolism, or inflammation in the GI tract or liver.

Thesis Award

One award is available each year for each program stream. Students who receive unanimous recommendations for a program award at their thesis defense will be eligible for the award, subject to

available funding. No application is required as the GRADUATE PROGRAM ADMINISTRATOR will set up this award automatically upon receipt of the Examiners' Reports.

Tuition Award

Each student entering their program is eligible for a Tuition Award. The award is set up by the GRADUATE PROGRAM ADMINISTRATOR at the end of the student's third month in the program if the student has met their program requirements. Eligible students will have forwarded their Student-Supervisor Memorandum of Understanding, Lab Checklist, Emergency Contact Information, and a signed Supervisory Committee Appointment form. Failure to submit the forms may result in the student not receiving their award.

MSc students will receive one award in the first year of their program. PhD students may receive one award in their first year and one award in their second year, provided they are in good standing in the second year of their program.

Appendix G: MDSC

MDSC Course Descriptions

MDSC course descriptions can be found in the Faulty of Graduate Studies Calendar - https://www.ucalgary.ca/pubs/calendar/grad/current/medical-science.html

Courses

Mandatory core courses are not required in the MDSC program. Master's students are required to complete two (2) half courses and Doctoral students are required to complete three (3) half courses. Course requirements should be discussed with the supervisor and the supervisory committee members.

Seminar/WIP/RIP Requirements

Each student is required to participate in a regularly scheduled Journal Club and Research In Progress seminar series, presenting at least once a year in each. Conference presentations cannot be substituted for these requirements.

Awards

All award forms are available at this link – go down to Program Specific Awards - http://cumming.ucalgary.ca/gse/programs/medical-science

Program Specific Award (PSA)

Scholarship payments will be assigned to students in MDSC using the following guidelines:

- Complete Award form – students paying full fees - see link above
- First year Master's students receive $2500 at the end of their first year if all program requirements are complete.
- Students in the first year of a Doctoral program or students who transfer from a Master's program receive $3000 at the end of their first year if all program requirements are complete.
- Students in the second year of their Doctoral program receive $3000 at the end of the year if all program requirements are complete and they are paying full fees.

Travel Award

Travel reimbursements may be provided pending budgetary obligations and availability of funds. Master's students may receive **two** awards during their program. Doctoral students may receive **four** awards during their program. Award value is $350 for travel within Alberta and $1000 for travel elsewhere. A travel award application will be required and must be accompanied by:

- Complete Travel Award form – see link above
- Confirmation of presentation of either an oral presentation or a poster at the conference
- Copy of the abstract being submitted
- Indication by the supervisor that they endorse the student's planned attendance at the conference (Signature on the application form)
- Receipts totaling the amount claimed (transportation, hotel, registration). The award will be paid out after the conference date.

1st Authored Paper Award

The award is for peer-reviewed research article for work done during their program. Master's students may receive **two** awards during their program. Doctoral students may receive **four** awards during their program. Award value is $250. Shared first authorships receive half the amount but count fully toward the quota.

- Complete Publication Award form – Academic Productivity - see link above
- Attach copy of the article being submitted
- Indication by the supervisor that the article was accepted for publication (Signature on the application form)

Supervisory Privileges

(a) Junior PhD faculty members with limited supervisory experience or those with an MD will be approved to supervise M.Sc. students. They are encouraged to sit on other M.Sc. and Ph.D. students' supervisory committees, and to participate in candidacy and thesis examinations. Supervisors with an MD are required to have an experienced co-supervisor.

(b) After convocation of one MSc student, these individuals can be transferred to full supervisor status of M.Sc. and Ph.D. students.

(c) Note: A supervisor in the MDSC program must not be permitted to supervise more than 6 graduates in the same term period.

Appendix H: MDNS

Graduate Course Requirements

A key component of the program is a comprehensive series of mandatory and optional courses. Courses are used to expand the general information base of the students, but they are useful only if they allow the student to become competent in acquiring information independently. In as much as the independent scientist needs to keep up with developments in the field, the required graduate courses are directed towards this future need. They are not used as a dominant measure of the student's development. This philosophy is reflected in the minimal course requirements within the program (two core courses for MSc students, and two core courses and one additional course for PhD students). Note that these are the minimum standards set by the Department; additional course work can be and often is required by the student's supervisory committee. Also note that the Faculty of Graduate Studies requires students to take at least one half-course while registered as a Ph.D. student. Credit for Neuroscience core courses, taken when the student is not registered in the Neuroscience Program, may be granted at the discretion of the GEC.

Mandatory Core Courses

In recognition of the fact that all students graduating with a neuroscience degree should be able to exhibit a basic understanding of the brain at a molecular, cellular, and systems levels, two core courses have been developed. All students registered as of May 2010 or later must successfully complete these two core courses in the first year of the Program: Cellular and Molecular/Developmental Neuroscience (MDSC 619.01), and Systems Neuroscience/Neuropathology (MDSC 619.02). It is advised that the core courses be taken in succession, though the Graduate Program Director may allow them to be taken out of order for January PhD admissions. To provide the necessary breadth of expertise, these courses are team-taught by specialists in the relevant areas. Nevertheless, little background knowledge is assumed other than an undergraduate science education. Despite this "ground up" approach, evaluation of original research papers and in some cases writing of research grant proposals are important aspects of these courses, which also highlight both general experimental techniques and research areas of contemporary importance. The objective of these courses is to educate students in all areas of contemporary neuroscience research in sufficient depth that any general neuroscience seminar should be comprehensible.

Options for Third Course (PhD students).

Students enrolled in the Ph.D. program must also take at least one additional course that best fits with the student's research program. The objective of the third course is to provide students with a knowledge base of sufficient depth in their own specialty so that any publication in the area should be comprehensible. These courses are designed to provide in-depth knowledge in a variety of neuroscience areas. They vary in their format and expectations, but generally focus on specific research topics with an emphasis on recent advances and controversies, as well as details of techniques. The third course option will be chosen in consultation with the supervisory committee. A number of optional, specialized graduate courses are available in the Cumming School of Medicine that are designed to provide in-depth knowledge in various areas of neuroscience and other related disciplines. These courses vary in their format and expectations, but generally focus on specific research topics with an emphasis on recent advances and controversies, as well as details of techniques. Graduate students within the Department

of Neuroscience are also encouraged to broaden their education by taking courses offered by other departments of the University.

As an alternative for their third course option, students can attend National/International courses that offer instruction in topics/disciplines not offered at the University of Calgary. Students interested in this option should contact the Graduate Program Director(s) for additional information.

Although considerable general and specialized knowledge is provided by these courses, overall education of students is provided by integration of course work with all other aspects of the program, e.g., research training in the Supervisor's lab, research seminars of the Hotchkiss Brain Institute and other groups, journal clubs, lab meetings, candidacy exams and Supervisory Committee meetings. Because of the translational aspect of many of the Hotchkiss Brain Institute programs as well as the hosting of the graduate program in a medical school environment, it is also possible for students to obtain exposure to clinical aspects of their research through attendance at clinical hospital rounds, shadowing of clinician investigators and participation in program retreats

Other Requirements

1. Laboratory-Based Safety and Ethics Certification: The Cumming School of Medicine requires that students working with animals in their program complete the necessary training requirements to be certified in animal care through the Animal Resources Center. Equivalent certification is required for work with humans and human tissues/samples (CHREB). Work in wet-labs also requires WHMIS certification, as well as Biohazard and Radioactivity certification, depending on the project. It is the responsibility of the student and supervisor to ensure that all necessary certification is in place prior to commencing laboratory work.

2. Regular participation in the HBI weekly seminar series. Attendance at the Friday HBI seminar is a mandatory requirement for all Neuroscience Graduate Students.

3. Regular participation in at least one Journal Club. Members of the Department of Neuroscience and the HBI run a number of journal clubs. Each student must participate in at least one of these journal clubs, and must give at least one journal club presentation per year (http://www.ucalgary.ca/neuroscience/node/28).

4. Participation in the Neuroscience Research-In-Progress (RIP) seminars. While research in progress seminars are not mandatory; they are strongly encouraged. Students should seek out opportunities to present their work, including in the student seminar series ran by the HBI Training Organization (HBITO). Students are also encouraged, where practical, to attend and participate in provincial, national and international scientific meetings.

Appendix I: MDPA

MDPA Program Description

Pathologists' Assistants (PAs) are "physician extenders" for anatomic pathologists. PAs perform delegated medical tasks under the supervision of a medically qualified pathologist. They perform initial examination, dissection, and gross description of surgically removed tissues, assist in dissection of bodies during autopsies, and perform intraoperative frozen sections. They possess highly standardized skills related to each of these procedures which allow pathologists to spend more of their time looking at slides.

This is a two year course based Master's Program.

The University of Calgary MDPA program has been formally accredited by the **National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)**, an American agency that accredits training programs of allied health professionals who work in anatomic pathology or clinical pathology laboratories. NAACLS approval is based upon a formal evaluation process demonstrating that the program appears to meet all requirements for formal accreditation.

Course Requirements

The Pathologists' Assistant program consists of the following 45 units, these are required courses:

- MDSC 751.43: Orientation and Clinical Rotations for Pathologists' Assistants (3 units)
- MDSC620: Topics in Systems Physiology (3 units)
- MDSC 703: Human Anatomy: Concepts, Exploration and Teaching (3 units)
- MDSC 744: Human Pathology (6 units)
- MDSC 515: Cellular Mechanisms of Disease (3 units)
- MDSC 745: Human Histology (3 units)
- MDSC 748.01: Surgical Pathology Practicum 1 (3 units)
- MDSC 748.02: Surgical Pathology Practicum 2 (3 units)
- MDSC 749.01: Autopsy Pathology Practicum 1 (3 units)
- MDSC 749.02: Autopsy Pathology Practicum 2 (3 units)
- MDSC 747: Pediatric Pathology Practicum (3 units)
- MDSC 750.01: Pathologists' Assistant Research Project 1 (3 units)
- MDSC 750.02: Pathologists' Assistant Research Project 2 (3 units)
- MDSC 746: Integrated Pathologists' Assistant Skills (3 units)

MDPA Program Specific Student Handbook

A student handbook outlining expectations and specific module based objectives for the practical year will be given out one month before the practical rotation begins.

Supervision

There is no requirement for securing a supervisor prior to applying. The Graduate Program Director(s) will act as supervisor for the program.

Funding/Stipend

There is no guaranteed funding for this program

MDPA Fees

Fees for this program consist of:

- Program fee ($8500/year)
- Course-by-Course tuition fee
- General Fees

See FGS Fees pages for more details

Awards

Currently there are no awards specific to this program

Appendix J: Leaders in Medicine

LIM Program Description

The Leaders in Medicine (LiM) program is a joint physician-scientist training program at the University of Calgary's Cumming School of Medicine. The program is designed to enable highly motivated students to complete a graduate and medical degree through the University of Calgary. The program's objective is to train clinicians for a diverse range of careers in academic medicine.

Our students are registered in MD/PhD and MD/MSc programs, as well as MD/MBA and MD/MA degrees. The most common graduate programs selected by Leaders in Medicine participants are offered through the Cumming School of Medicine, although students from many other faculties including Business and Engineering are welcome to participate.

LIM Program Eligibility

University of Calgary students who are enrolled in a graduate degree and have been accepted in the MD program, or vice versa, are eligible to apply for the LIM joint degree program. Although there is some flexibility, joint degree students generally defer their MD matriculation until completion of graduate studies.

Application into a graduate program and Undergraduate Medical Education must be done separately, based on each programs eligibility requirements. Once accepted into both programs a student then contacts the program office mdgrad@ucalgary.ca and requests a LIM joint degree application. UME sends offers of admission in April and May, and the joint degree enrolment generally starts in the summer semester.

The program is flexible so there are some anomalies regarding start and end times for each part of the joint degree. Students work with the program office and program directors, along with their graduate program supervisors and the UME office to coordinate any exceptions. Figure 8 visually represents the three standard study streams. The top is the most likely stream, the middle is available with program approval and the bottom is for MD students who wish to pursue a graduate degree.

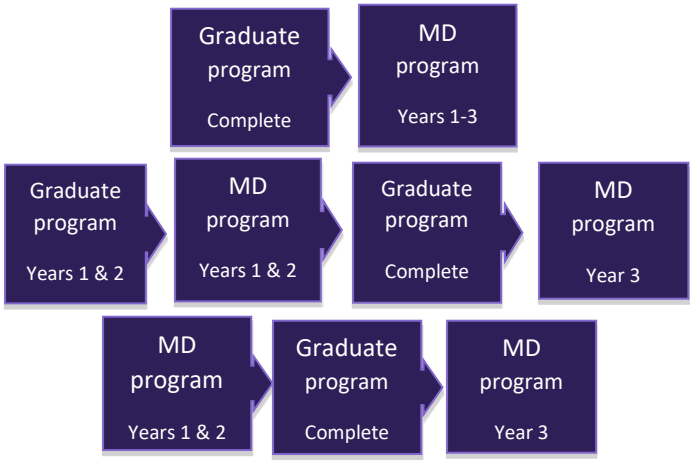

Figure 8. Leaders in Medicine Progression

More information about the program is available on the websitehttp://cumming.ucalgary.ca/lim/

Any question concerning the Leaders in Medicine program should be directed to the LIM program administrator at mdgrad@ucalgary.ca