

# **Collaborative Program in Biostatistics**

## **Procedures & Policies**

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## **PREAMBLE**

The Collaborative Program in Biostatistics was approved by University Council on June 18, 2009. It is a collaboration of the Department of Community Health and Epidemiology, the Department of Mathematics and Statistics, and the School of Public Health.

The administrative home of the program is the School of Public Health. The provision of administrative support is the responsibility of the Executive Director of the School of Public Health.

### **1. PROGRAM COMMITTEE**

The Collaborative Program in Biostatistics is governed by a Program Committee. The responsibilities of the Program Committee are:

- To review, evaluate, and make recommendations for admission regarding all applications to the Collaborative Graduate Program in Biostatistics;
- To make recommendations about student funding;
- To ensure that the objectives, policies, and procedures of the College of Graduate Studies and Research are followed in the Collaborative Graduate Program in Biostatistics;
- To evaluate the MSc and PhD programs and the core courses that comprise this program;
- To liaise between the program and the SPH graduate chair, and the collaborating units with periodic reports; and
- To coordinate and organize the seminar course BIOS 990.

#### **1.1 Membership and Structure**

The membership of the Committee is comprised of the following:

- Chair of Graduate Programs, School of Public Health – nonvoting
- School of Public Health Program Coordinator – nonvoting
- Head, Department of Community Health and Epidemiology – nonvoting
- Head, Department of Mathematics and Statistics – nonvoting
- Executive Director, School of Public Health – nonvoting
- 1 representative of the Department of Community Health and Epidemiology, appointed by the Head
- 1 representative of the Department of Mathematics and Statistics, appointed by the Head
- 1 representative of the School of Public Health, appointed by the Executive Director
- Student representative (2 year term of service)

The Chair will be selected from amongst the voting members of the Program Committee. Normally the Chair will serve for a one-year term and will rotate amongst the three academic units represented on the Program Committee.

For the first two years of the program (i.e. academic years 2009-10 and 2010-11) the Chair will be the Head (or designate) of the Department of Community Health and Epidemiology and will be an additional member of the Committee (i.e., supplementary to the membership specified above). The Chair will be a non-voting member of the Committee in the first two years of the program. This structure is being implemented in recognition of the additional demands placed

on the Program Committee during the initial program development phase and the need to ensure balanced representation from each of the units involved in the Collaborative Program in Biostatistics.

### **1.2 Governance**

Governance of the structure of the membership of the Program Committee is the responsibility of the three collaborating units.

### **1.3 Meetings**

The Collaborative Biostatistics Committee normally meets monthly during the regular term. The Student Representative will be asked to leave for any discussion of student admissions, funding decisions and student specific issues. Agenda and Meeting Minutes will be distributed among the committee members excluding any confidential student information items. A standard agenda item will be added asking for report from the Student Representative.

## **2. GENERAL ADMISSION PROCESS**

The admission process will adhere to the regulations of the College of Graduate Studies and Research (CGSR). All students must meet the College of Graduate Studies and Research requirements with regards to admission to the Collaborative Program in Biostatistics.

### **2.1 Admission to the MSc Program**

Students seeking admission to the MSc program must have completed a four-year BSc or BA degree from a recognized university in one of the following: mathematics, statistics, applied statistics, biostatistics, quantitative psychology, or another discipline with a strong background in mathematics or statistics with a minimum 75% grade point average in the last 60 credit units. Applicants must have completed undergraduate courses in mathematical statistics and statistical inference (STAT 342 and STAT 442) or their equivalents.

Applicants holding a BSc in another discipline with at least an 80% grade point average will be admitted as probationary MSc students and required to complete qualifying courses before being considered for admission to the MSc program. These courses and expected performance in them will be determined by the Program Committee.

### **2.2 Admission to the PhD Program**

Students must have completed a thesis-based MSc from a recognized university in one of the following: mathematics, statistics, applied statistics, biostatistics, quantitative psychology, or another discipline with a strong background in mathematics or statistics with a minimum 75% grade point average. In order to be eligible for admission to the PhD program, a student must have taken the following courses (or equivalents as judged by the Program Committee) during his/her MSc program: CHEP 800.3 (Epidemiology I), STAT 850.3 (Mathematical Statistics and Inference), and PUBH 842.3 (Current Biostatistical Methods and Computer Applications). Students without these courses will be admitted as probationary students and will be required to complete these courses with a minimum 80% grade point average before being considered fully qualified for the PhD program.

### **2.3 Application Information**

The application requirements are:

- A completed application form (GSR 100) available from the College of Graduate Studies and Research;
- Three letters of recommendation accompanied by completed Confidential Letter of Recommendation Forms (GSR 101) available from the College of Graduate Studies and Research;
- A writing sample of 1000 to 1200 words that includes a statement of the student's education and employment history and how it relates to the study of biostatistics, a description of the student's education and career goals, and an assessment of how the University of Saskatchewan's Graduate Program in Biostatistics will help to achieve these goals;
- A current curriculum vitae;
- A non-refundable application fee as set by the College of Graduate Studies and Research;
- Certified, official transcripts of the student's academic record from each post-secondary institution attended;
- Evidence of English proficiency for applicants who have English as a second language, as required by the College of Graduate Studies and Research;
- A letter of support from the proposed supervisor (for PhD students only) indicating availability of funding;
- A summary of the proposed research (for PhD students) that describes the student's dissertation topic and how it links with the supervisor's area(s) of research expertise. This description will be 1200 to 1500 words in length.

### **2.4 Typical Admission Procedure**

- Student approaches contact person (e.g. SPH Program Coordinator) for the Collaborative Graduate Program and expresses interest in the program.
- With assistance, student identifies potential supervisor (PhD only).
- Both supervisor and student agree to a research project (PhD only).
- Student sends application requirements to the SPH Program Coordinator. Written confirmation of financial commitment to student by supervisor is required (minimum one year of funding is required) (PhD only).
- Program Committee reviews application and makes decision based on academic credentials, letters of reference, quality of written material, and past experience and scholarly contributions.
- Program Committee makes recommendation to the College of Graduate Studies and Research via the Chair of Graduate Programs, SPH, with a copy to the Program Committee Chair.

### **2.5 Transfers from MSc Program to PhD Program**

Students who wish to transfer directly from the MSc program to the PhD program must:

- complete a minimum of 12 credit units of coursework at the MSc level (9 required credit units and 3 elective credit units), and
- maintain an 80% average for these courses.

The request for transfer will typically occur at the end of the first year in the MSc program or after completion of 12 credits, whichever occurs first, but no later than at the end of the second year in the MSc program. The Program Committee will review the academic credentials of the candidate, including previous examinations, coursework and scholarships. The Committee will determine if the applicant meets the requirements for admission to the PhD program. This decision will be made in consultation with the student's Advisory Committee.

### **3. STUDENT ADVISORY COMMITTEE**

As soon as possible following a student's first registration in the MSc or PhD program, an Advisory Committee shall be established by the program committee in consultation with the potential supervisor.

For students enrolled in the MSc program, the Advisory Committee will consist of at least three members: student's supervisor, one core faculty member, and the Chair of the Program Committee or designate.

For students enrolled in the PhD program, the Advisory Committee will consist of at least five members: student's supervisor, two core faculty members, one cognate faculty member, and the Chair of the Program Committee or designate.

The student's supervisor must be a core faculty member. In cases when a student is co-supervised, which counts as a single membership for voting purposes in the Advisory Committee, an additional member will need to be appointed to achieve the minimum composition of the Advisory Committee.

The Advisory Committee will meet at least once per year in person. The student will typically give a brief oral presentation at this annual meeting highlighting the progress made in the program of study and research project. The student is required to submit a written report of his/her progress to the members of the Advisory Committee prior to this meeting date. Minutes of the meeting will be recorded by the Chair of the Program Committee or his/her designate.

Meetings with the Advisory Committee are seen as an opportunity for the student to interact with the members of the Committee and to obtain advice and feedback. However, interactions between student and members of the Advisory Committee are not limited to these meetings and should occur as needed.

#### **3.1 Core Faculty Members**

Designation as a core faculty member is made by the Program Committee in consultation with the Heads/Executive Director of the Department of Community Health and Epidemiology, Department of Mathematics and Statistics, and/or School of Public Health. Normally a core faculty member will hold a full-time appointment in the Department of Community Health and Epidemiology, Department of Mathematics and Statistics, or School of Public Health.

Currently, the core faculty members are:

- Hyun Lim, Department of Community Health and Epidemiology
- Punam Pahwa, Department of Community Health and Epidemiology
- Miķelis Bickis, Department of Mathematics and Statistics
- William Laverty, Department of Mathematics and Statistics
- Longhai Li, Department of Mathematics and Statistics
- Juxin Liu, Department of Mathematics and Statistics
- Chris Soteris, Department of Mathematics and Statistics
- Raj Srinivasan, Department of Mathematics and Statistics
- Shahed Khan, Department of Mathematics and Statistics
- Lisa Lix, School of Public Health

#### **4. PROGRAM OF STUDY**

The program of study will be developed by the student's Advisory Committee. The Program Chair will provide the necessary information to the designated member at the School of Public Health Graduate Office, who will complete the form GSR 208 by the end of the first year. For the MSc degree, the program of study consists of coursework and a thesis. For the PhD degree, the program of study consists of coursework, qualifying examination, comprehensive examination, and a dissertation.

The minimum residency requirement for the MSc program is one regular academic session and at the PhD level the minimum residency requirement is two regular academic sessions. A regular academic session runs from September to April. Students are normally expected to complete all coursework requirements during the residency period. During the residency period, students are expected to be on-site at the University of Saskatchewan. After fulfilling the residency requirement, students must maintain continuous registration until completion of their program of study.

##### **4.1 MSc Program: Coursework Requirements**

MSc students are required to complete a minimum of 15 credit units of coursework, of which 9 credit units are required courses and 6 credit units are elective courses. The required credit courses are:

- CHEP 800: Epidemiology I
- STAT 850: Mathematical Statistics and Inference
- PUBH 842: Current Biostatistical Methods and Computer Applications

In addition, students are required to complete the following non-credit requirements:

- GSR 960: Introduction to Ethics and Integrity
- GSR 961: Research in Human Ethics
- BIOS 990: Seminar in Biostatistics
- BIOS 994: Master's Research: Biostatistics

Normally, the credit and non-credit course requirements for the MSc degree will be completed as follows:

- **Year I:** The following courses will be taken in Term I: CHEP 800, PUBH 842, one 3-credit unit elective course. The following courses will be taken in Term II: STAT 850, one 3-credit elective course, GSR 960. Each student will also register in BIOS 990 and BIOS 994 in both terms.
- **Year II and subsequent years:** Each student will register in the following in both terms: BIOS 990, BIOS 994.

The elective courses will be appropriate to the student's research and will be chosen in consultation with the Advisory Committee. A number of potential elective courses are offered by the Department of Community Health and Epidemiology, Department of Mathematics and Statistics, School of Public Health, College of Veterinary Medicine, Department of Sociology, Department of Computer Science, and Department of Psychology. In the absence of a suitable elective course in any of the Departments or Schools, students may either take a reading course with the permission of the student's Advisory Committee or may take courses (see Sections 5.2.1 and 5.3.1 of the CGSR Policy & Procedures Manual) at another university and apply to have the course (see Section 5.3.1 of the CGSR Policy & Procedures Manual) accepted by the College of Graduate Studies and Research as an equivalent of program course requirements.

#### **4.2 MSc Program: Thesis Requirements**

The MSc program also requires the completion of a written thesis. The thesis topic is selected in consultation with the candidate's supervisor and Advisory Committee members. Students are required to make an oral presentation about the proposed research to the Advisory Committee. The thesis proposal must be approved by the Advisory Committee. The Advisory Committee Chair must communicate results to the Graduate Chair of SPH.

Each student is required to undergo an oral examination of his/her thesis research. All regulations of the College of Graduate Studies and Research regarding the requirements for the oral examination will be adhered to.

#### **4.3 PhD Program: Coursework Requirements**

Students will complete a minimum of 15 credit units of coursework, of which 12 credit units are required courses and 3 credit units are elective courses. The required courses are:

- CHEP 806: Applied Statistical Methods for Follow-Up Data
- STAT 841: Probability Theory
- STAT 848: Multivariate Data Analysis
- One of the following:
  - STAT 834: Advanced Experimental Design
  - CHEP 810 Advanced Clinical Trials

In addition, students are required to complete the following non-credit unit requirements:

- GSR 960: Introduction to Ethics and Integrity (if not already completed)
- GSR 961: Research in Human Ethics (if required)
- BIOS 990: Seminar in Biostatistics
- BIOS 996: PhD Research: Biostatistics

Normally, the credit and non-credit course requirements for the PhD degree will be completed as follows:

- **Year I:** The following courses will be taken in Term I: STAT 841, one three-credit elective course, GSR 960. The following courses will be taken in Term II: CHEP 806, STAT 834 OR CHEP 810, STAT 848, elective course, BIOS 990, GSR 960. Each student will also register in BIOS 990 and BIOS 996 in both terms.
- **Year II and subsequent years:** Each student will register in the following in both terms: BIOS 990, BIOS 996.

The elective courses will be appropriate to the student's research and will be chosen in consultation with the student's Advisory Committee. A number of potential elective courses are offered by the Department of Community Health and Epidemiology, Department of Mathematics and Statistics, School of Public Health, College of Veterinary Medicine, Department of Sociology, Department of Computer Science, and Department of Psychology. In the absence of a suitable elective course in any of the Departments or Schools, students may either take a reading course with the permission of the student's Advisory Committee or may take a course (see Sections 5.2.1 and 5.3.1 of the CGSR Policy & Procedures Manual) at another university and apply to have the course accepted by the College of Graduate Studies and Research as an equivalent of program course requirements.

#### **4.4 PhD Program: Qualifying Examination Requirements**

PhD students or students transferring from the MSc program to the PhD program are required to pass a qualifying examination. The purpose of this examination is to ensure that the student has sufficient knowledge of the chosen general field of study to proceed toward candidacy for the PhD degree. The content of the examination shall fairly and reasonably reflect material which the student could be expected to know and understand in view of the prevalent and current norms of the discipline and the student's chosen area of research.

The qualifying examination will be administered by an Examination Committee. The examination will be scheduled by the Chair of the Program Committee normally before students begin their second academic year. The Examination Committee will be appointed by the Chair of the Program Committee and will consist of no more than three core faculty members. The qualifying examination will be in written form. The examination should last no longer than four hours. It will be completed without access to books or computers, although access to a calculator will be permitted. The examination will consist of questions on three topics of basic statistical theory and/or its application. The student will choose these three topics from a list of four topics. According to CGSR Regulations, the Qualifying Examination Committee will be chaired by the Program Chair or his / her designate.

The qualifying examination will be evaluated on a pass/fail basis by each member of the Examination Committee. Overall consensus by Committee members is required to assign a final pass/fail mark to the examination. The results of the qualifying examination will be conveyed to the student, the Advisory Committee and the College of Graduate Studies and Research.

The oral examination for the award of the student's MSc degree at a recognized university may, at the discretion of the Program Committee and the College of Graduate Studies and Research,

be accepted in lieu of the qualifying examination at the recommendation of the student's Advisory Committee.

A student who fails the qualifying examination is permitted a second examination with permission of the Program Committee. A second failure automatically disqualifies the student from further work on the PhD degree. The failure may be appealed to the Program Committee.

#### **4.5 PhD Program: Comprehensive Examination Requirements**

The purpose of the comprehensive examination is to determine whether the student has a mature and substantive knowledge of the field as a whole. Normally this examination is scheduled after the student has completed all coursework requirements and before beginning the doctoral research. The examination is on topics cognate to the candidate's field of research. A student passing the Comprehensive Examination is deemed a PhD candidate. The Comprehensive Examination will be administered within the guidelines of Section 5.3.1 of the CGSR Policy & Procedures Manual.

The comprehensive examination is administered by an Examination Committee that is comprised of all members of the Student's Advisory Committee. The examination has oral and written components. Both components will test the student on theoretical and applied statistical concepts.

For the written component, the Examination Committee will decide on four questions that address topics related to the research project, but not restricted to the area of research. The student must choose three of these questions for the comprehensive examination. The examination will have a take home format. It must be completed within seven days. All members of the Examination Committee will assess the student's answers. The written component must be passed before the student can take the oral component which will follow the written component within three months.

For the oral component of the comprehensive examination, the student will present his/her dissertation research proposal to members of the Examination Committee. The student will be evaluated based on his/her defence of the proposal.

The comprehensive examination must normally be passed no later than 36 months after first registration as a PhD student.

According to CGSR Regulations, the Comprehensive Examination Committee will be chaired by the Program Chair or his/her designate.

#### **4.6 PhD Program: Dissertation Requirements**

The PhD program requires the completion of a written dissertation based on the research proposed and defended as part of the comprehensive examination.

The student will be required to undergo an oral examination of his/her dissertation. All regulations of the College of Graduate Studies and Research regarding the requirements for the oral examination will be adhered to.

## **5. SEMINAR COURSE: BIOS 990**

The non-credit seminar course, BIOS 990, is a requirement for all MSc and PhD students in the Collaborative Graduate Program in Biostatistics.

Graduate students must attend a minimum of 75% of the seminar sessions each academic year. MSc students will normally be expected to present in one seminar session in the second year of their program, and PhD students will normally be expected to present in one seminar in each of the second and third years of their program.

## **6. STUDENT RESOURCES**

Office space for each graduate student will be assigned within the Department/School of the supervisor. Space and equipment required for conducting the student's research will be the responsibility of the supervisor. The nature of the research project will determine the type and amount of space and equipment required by the student.