Department of Statistical Sciences
Graduate Student Handbook 2018-19

This handbook outlines the basic rules, regulations and procedures for graduate students in the Department of Statistical Sciences (DoSS), University of Toronto. Please note, however, that general regulations (degree regulations, details regarding fees, etc.) of the School of Graduate Studies (SGS) also apply to this Department. The SGS Calendar takes precedence over this Handbook. Graduate students of the Department are expected to familiarize themselves with both sets of regulations.

The deadlines for enrolment, submission of scholarship and fellowship applications, and dates for the completion of all academic work must be adhered to by all graduate students. Departmental policies are subject to change according to guidelines established by the SGS.

Please visit the Department's website as well as the SGS website for more details about the program and courses offered as well as policies and procedures offered by the Department and SGS.

      Department of Statistical Sciences Website: http://www.utstat.toronto.edu

      School of Graduate Studies Website: http://www.sgs.utoronto.ca

KEY DEPARTMENTAL CONTACTS

Click here for a complete list.

1. PROGRAM & COURSES

Master's Program (M.Sc.)

The full-time Master's program normally takes 2 academic sessions (from September to April) to complete and students are required to complete **4.0 full course equivalents (FCEs),** i.e., the equivalent of *8 one semester courses*. There is no thesis component, however, students are encouraged to take on project / research based courses if they are considering going on to a PhD.

M.Sc. program students are **required** to take **2.0FCEs** (the equivalent of 4 one semester courses) out of the following core course selection:

- STA2101H   Methods of Applied Statistics I (0.5 FCE)
- STA2111H   Graduate Probability I (0.5 FCE)
- STA2112H   Mathematical Statistics I (0.5 FCE)
- STA2201H   Methods of Applied Statistics II (0.5 FCE)
- STA2211H   Graduate Probability II (0.5 FCE)
- STA2212H   Mathematical Statistics II (0.5 FCE)

NOTE:

1. Those continuing on to a PhD should strongly consider taken Probability I & II and Math Stats I & II as well as complete a research project under the course code STA 4000.

2. Students who have taken the equivalent of Math Stats I & II or Applied Stats I & II in their previous degree, may be waived these requirements. In such cases, students will only be required to complete the missing components from the above list, but still must complete a total of 4.0 FCEs.

The remaining 2.0FCEs (the equivalent of 4 one semester courses) may be selected from:

- Any graduate course offered by the Department of Statistical Sciences of 2000 level or higher
- 0.5 FCE as a reading course under the course code STA 4000HF/4000HY or 4001HF
- 0.5 FCE as a research project under the course code STA 4000HF/4000HY or 4001HF
- At most 1.0 FCEs from the collection of 6 week courses with course code STA 45## - each of these courses count as 0.25FCEs – i.e., a maximum of 4 of these 6 week courses
- Graduate courses offered by other departments at U of T of 1000 level or higher (with approval of the Associate Chair, Graduate Studies) with enough statistical, computational, probabilistic or mathematical content.

All programs must be approved by the Associate Chair for Graduate Studies.

NOTE:

1. Students should not take courses that almost entirely duplicate material studied for a previous degree; however, it is fine to take courses that cover similar material at a substantially higher level.

2. The Associate Chair, Graduate Studies meets with all students (full-time and part-time) before final course choices are made to ensure that the courses chosen provide the best preparation for the student's future plans.

Masters of Financial Insurance Program (MFI)

The MFI is a full-time, twelve-month, professional program based on three pillars: statistical methods, financial mathematics, and insurance modeling. The program provides students with a sophisticated understanding of this complex interaction of the financial and insurance fields. It contains a comprehensive set of offerings and students gain rigorous training in statistical science, actuarial science and finance. Graduates from this program will be well armed to face the highly skilled work required of them in the banking, insurance, pension and consulting industries.

The MFI is a three semester program with the first and second semesters containing course work including substantial group projects. During the third semester, students take on an industrial internship. Courses will be taught by both industry professionals as well as University of Toronto faculty members.

The program requirements are the successful completion of 5.5 full-course equivalents (FCEs) as follows:

- Nine required half courses (4.5 FCEs).
- STA 2560Y Industrial Internship, a 3.5-month summer internship (1.0 FCE). Students must submit a project proposal to the program director and select an advisor by April 15. Students will propose a placement site to be approved by the department. The department will provide approval of the proposal by May 15. An interim report is required by July 7. Students must prepare a final written report and deliver an oral presentation on the internship project at the conclusion of the internship.

Course Requirements:

Fall Session

MMF 2021H	Numerical Methods for Finance
STA 2503H	Applied Probability for Mathematical Finance
STA 2530H	Applied Time-Series Analysis
STA 2535H	Life Insurance Mathematics
STA 2550H⁺	Financial Insurance Seminar Series (Credit/No Credit)

Winter Session

ECO 2506H	Economics of Risk Management
STA 2540H	Insurance Risk Management
STA 2551H	Financial Insurance Case Studies
STA 2536H	Non-life Insurance Mathematics
STA 2550H⁺	Financial Insurance Seminar Series (Credit/No Credit)

Summer Session

STA 2560Y	Industrial Internship

⁺ *Extended course. For academic reasons, coursework is extended into session following academic session in which course is offered.*

MScAC Concentration in Data Science

Admission to this program is through the Department of Computer Science.

Students accepted into the MScAC program (starting in 2017) will be considered for the concentration in data science. Your letter of intent for the MScAC program must indicate an interest in data science and your objectives in pursuing this option.

Entry into the concentration is on a competitive basis and participation in the concentration will be limited to a relatively small group of MScAC students.

The course load is identical to that of the current MScAC program, with the exception of two of the four course electives in Computer Science are selected from offerings in the Department of Statistical Sciences. Please note course offerings in both computer science and statistical sciences may vary from year to year.

The MScAC concentration in data science is offered jointly by the Department of Computer Science and the Department of Statistical Sciences.

For more information see http://web.cs.toronto.edu/Graduate/prospective_gradwhy/mscac.htm

Doctoral Program (PhD)

The PhD program consists of three fields:
1. Statistical Theory and Applications,
2. Probability, and
3. Actuarial Science and Mathematical Finance.

All fields require the following:
i. the completion of **3.0 full course equivalents** (FCEs) – the equivalent of 6 one semester courses
ii. passing **three comprehensive examinations** and

iii. **completing and successfully defending a thesis** constituting a significant contribution to the field of the study.

Normally, this program takes 12 academic sessions (4 years) to complete. Course work and comprehensive examinations are normally completed in the first year of study; however, students are encouraged to continue taking courses suiting their interest throughout the remainder of their study. Thesis work normally begins at the end of the first academic year after completing the comprehensive examinations; though, students are highly encouraged to begin discussing ideas and topics with faculty members from the time they arrive.

Specific details on program requirements for each of the three fields are listed below.

Statistical Theory and Applications Field and Probability Field

Course Requirements:

During the first year of study, students are required to complete the following **3.0 FCEs** :

- STA2111H   Probability Theory I
- STA2211H   Probability Theory II
- STA2101H   Methods of Applied Statistics I
- STA2201H   Methods of Applied Statistics II
- STA3000Y   Advanced Theory of Statistics

NOTE:

1. Students should not take courses that almost entirely duplicate material studied for a previous degree; however, it is fine to take courses that cover similar material at a substantially higher level.

2. The Associate Chair, Graduate Studies meets with all students before final course choices are made to ensure that the courses chosen provide the best preparation for the student's future plans.

Comprehensive Examination Requirements:

At the end of the first year, students must attempt the following comprehensive examinations:

a. Theoretical Statistics: based on material from
   STA3000Y   Advanced Theory of Statistics
   STA2112H   Mathematical Statistics I
   STA2212H   Mathematical Statistics II

b. Probability Theory: based on material from
   STA2111H   Probability Theory I
   STA2211H   Probability Theory II

c. Applied Statistics: based on material from
   STA2101H   Methods of Applied Statistics I
   STA2201H   Methods of Applied Statistics II

Students must pass at least one of the three examinations in their first attempt, otherwise they may be asked to withdraw from the program.

All three examinations must be passed by the end of the second year. In particular, students will receive only two opportunities to pass all comprehensive examinations. If a student fails to pass all three comprehensive examinations by the end of the second year, they may be asked to withdraw from the program.

Attaining Ph.D. Candidacy:

In order to continue further in the PhD program, students will have to meet all the requirements listed above to fulfill the recommendation for PhD Candidacy before starting their **thesis.**

Thesis Requirements:

Conducting original research is the most important part of doctoral work. The thesis document must constitute significant and original contribution to the field. Students must select a thesis advisor before the end of year two, and preferably have discussions with potential supervisors during year one. A thesis committee consisting of a supervisor and, if applicable, a co-supervisor, plus two other faculty members must also be selected before the end of year two. **Moreover, students must hold yearly committee meetings with the thesis committee to assess their progress. A formal report must be submitted to the Department each year beginning in year two.** The completed thesis must be presented and defended within the Department of Statistical Sciences in addition to being presented and defended at the School of Graduate Studies (SGS).

Actuarial Science and Mathematical Finance Fields:

Course Requirements:

During the first year of study, students are **required** to complete the following **3.0 full-course equivalents** (FCEs):

1. All of:
   a. STA 2111H: Probability Theory I
   b. STA 2211H: Probability Theory II, and
   c. STA 2503H: Applied Probability for Mathematical Finance
2. One of:
   a. STA 4246H: Research Topics in Mathematical Finance, or
   b. STA 2501H: Mathematical Risk Theory
3. Either:
   a. STA 3000Y: Advanced Theory of Statistics;
      OR
   b. Both
      i. STA 2101H: Methods of Applied Statistics I, AND
      ii. STA 2201H: Methods of Applied Statistics II

Comprehensive Examination Requirements:

At the end of the first year, students must attempt the following comprehensive examinations:

a. Probability Theory: based on material from

   STA2111H   Probability Theory I
   STA2211H   Probability Theory II

b. Actuarial Science / Mathematical Finance: based on material from

   STA 2503 Applied Probability for Mathematical Finance, and
   STA 4246 Research Topics in Mathematical Finance, or
   STA 2501 Mathematical Risky Theory

c. Either Theoretical OR Applied Statistics:

   i. Theoretical Statistics: based on material from

      STA3000Y Advanced Theory of Statistics
      STA2112H Mathematical Statistics I
      STA2212H Mathematical Statistics II

   ii. Applied Statistics: based on material from

      STA2101H Methods of Applied Statistics I

      STA2201H Methods of Applied Statistics II

Students must pass at least one of the three examinations in their first attempt, otherwise they may be asked to withdraw from the program.

All three examinations must be passed by the end of the second year. In particular, students will receive only two opportunities to pass all comprehensive examinations.

Attaining Ph.D. Candidacy:

In order to continue further in the PhD program, students will have to meet all the requirements listed above to fulfill the recommendation for PhD Candidacy before starting their **thesis.**

Thesis Requirements:

Conducting original research is the most important part of doctoral work. The thesis document must constitute significant and original contribution to the field. Students must select a thesis advisor before the end of year two, and preferably have discussions with potential supervisors during year one. A thesis committee consisting of a supervisor and, if applicable, a co-supervisor, plus two other faculty members must also be selected before the end of

year two. **Moreover, students must hold yearly committee meetings with the thesis committee to assess their progress. A formal report must be submitted to the Department each year beginning in year two.** The completed thesis must be presented and defended within the Department of Statistical Sciences in addition to being presented and defended at the School of Graduate Studies (SGS).

2. **APPEALS**

All students have the right to appeal academic and/or procedural matters. All appeals must be directed in writing to the Undergraduate and Graduate Administrator. Matters not resolved at this level will be referred to the Department Chair and Associate Chair, Graduate Studies of the Department. Appeals rejected by the Department Chair and Associate Chair may be taken to the Associate Dean of the School of Graduate Studies. *See the SGS Calendar for further information.*

3. **REGISTRATION**

All graduate students must register with the Department at the beginning of each year for the duration of their programs.

4. **BUILDING ACCESS & OFFICE KEYS**

Building Access & Office Hours

The Department of Statistical Sciences is located on the 6th floor of Sidney Smith Hall at 100 St. George Street and the Departmental Office is open from Monday to Friday as follows:

September to June	9:00 am to 5:00 pm
July to August	9:00 am to 4:30 pm

Sidney Smith Hall operating hours are as follows:

Monday to Thursday	7:00 am to 10:30 pm
Friday	7:00 am to 6:00 pm
Saturday	10:00 am to 6:00 pm
Sunday	12:00 pm to 6:00 pm

For after-hours access to Sidney Smith Hall a building/tower key is required. Building/tower keys will be provided only to PhD students.

Office Keys

You will be provided with the following keys:

PhD Students	*Master's Students*
PhD key*	Master's key*
Building/tower key (upon request)	
Carrel key(s)	

Note: You will be required to pay a $20.00 deposit per key issued by the department. Should you lose a key, the penalty is $115 per key. This is the cost of re-keying a lock.

Study & Resource Space

The Department has arranged for study and resource space for both Master's and PhD students within 215 Huron Street. Please see Christine Bulguryemez for room assignment information.

5. **FINANCIAL SUPPORT**

All students in the Department's full-time Master's program and in the PhD program (years 1-4) receive the University's guaranteed minimum financial support package. For students admitted directly into the PhD program from a Bachelor's degree, funding is also provided for the fifth

year of the program. This support consists of $17,250 per 12 month academic year plus tuition fees and, for international students, includes the fees for the University Health Insurance Program (UHIP). PhD students in their fifth year (sixth year for direct entry students) may apply for a doctoral completion award from the School of Graduate Studies, however, this dollar value of this award is limited and there is no guarantee of receiving it.

The sources of funding during the first four years can include University of Toronto Fellowships, Teaching Assistant employment, Research Assistantships (stipends or employment), Internships (Accelerate Canada Internships) and major internal and external awards, such as Connaught admission scholarships, Ontario Graduate Scholarships, NSERC Postgraduate awards, FCAR (for applicants from Quebec), etc. All new full-time graduate students are automatically considered for the internal awards (e.g. Connaught admission scholarships). All graduate students are expected to search out and apply for external awards as part of the University's funding policy. External awards are also of benefit for the individual student on her/his Curriculum Vitae.

6. E-MAIL ACCOUNT AND COMPUTER LOGIN

All graduate students will be provided with an email account and computer login. All correspondence from the department will be sent to this email account. Once you have completed your studies in the Graduate program your e-mail account will be deactivated.

7. MAILBOXES

All graduate students will be provided with a Mailbox. Mailboxes will be located on the 4th floor of the Stewart Building and accessible during office hours M-F 9-5pm

9. STATISTICAL COMPUTING

Computing resources that are available for graduate student research include: Splus and R (data analysis and graphics language), SAS, Matlab, Mathematica and Maple (software for symbolic manipulation), and mathematical typesetting software including TeX and LaTeX. The University also maintains high-speed links to the Internet, which provides electronic mail, news, and web access to other research sites throughout the world.

10. SEMINAR SERIES

The Departmental Seminar Series is held every Thursday from 3:30 pm to 4:30 pm in Sidney Smith Hall. The seminars provide an opportunity for all department members to learn about recent developments in statistics throughout the world. Graduate students are expected to attend the seminars and are encouraged to use the opportunities presented to broaden their educational base.

- Master's students and PhD students in their first year are expected to attend at least 60% of all weekly seminars.

- PhD students in their second-year and higher are expected to attend at least 85% of all weekly seminars.
- PhD students in Actuarial Science and Mathematical Finance are expected to attend at least 85% of Department of Statistical Sciences and Fields Seminar series in Mathematical Finance and Actuarial Science.

11. STUDENT LEARNING CENTRE

The Student Learning Centre is located on the ground floor of Sidney Smith Hall in Room 623B. Teaching Assistants may use this room to hold office hours.

TA Marking Room

The TA Marking Room is located on the ground floor of Sidney Smith Hall in Room 623. Teaching Assistants may use this space for marking assignments.

12. MATHEMATICS AND STATISTICS LIBRARY

The Mathematics and Statistics Library is located in the Bahen Centre for Information Technology at 40 St. George Street, Room 6141. The library maintains an extensive collection of all major journals and research monographs.

13. TEACHING ASSISTANTSHIP (TA)

A limited number of teaching assistantships are available. Full-time students will normally be assigned TA work as part of their funding packages. TA assignments are usually from September to April, but may include May to August for PhD students. Application forms are available on the departmental website under Employment Opportunities, and should be submitted as early as possible, and definitely by the given deadline.

All TAs are provided with a link to the department's Teaching Assistant Handbook and will be expected to comply with the policies and procedures listed in it.

14. DEPARTMENTAL AWARDS

Statistics Doctoral Award

The Department of Statistical Sciences Doctoral Award is presented annually to a PhD student in the department who has demonstrated excellence in research in an area of statistics, probability theory, or actuarial science and mathematical finance. No application is required. All PhD students are considered. The award is made by the Associate Chair, Graduate Studies upon the advice of the department faculty. The award includes a certificate and a monetary prize from the Doctoral Award endowment fund.

Andrews Academic Achievement Award

This award is named in honour of Professor David F. Andrews of the Department of Statistical Sciences. An Andrews Academic Achievement Award will be awarded to any particularly outstanding student(s) who receive a M.Sc. degree from the department. Students are judged on criteria such as: level of difficulty of courses chosen; impression made on professors; course grades earned; any special work such as research projects, statistical consulting, etc.; as well as contributions made to other students and the department. No application is required. All graduating M.Sc. students are considered. Certificates are awarded by the Associate Chair, Graduate Studies upon the advice of the department faculty.

Teaching Assistant Award

The Department of Statistical Sciences Teaching Assistant Award reflects the importance that the Department places on undergraduate teaching and the importance of the acquisition of good teaching skills as part of graduate student training. The award is presented annually to three graduate students who have either lectured in a course or lead a tutorial throughout at least one term. The criterion for the award is the quality of the TA's work measured by student evaluations and faculty input.

Student Travel Award

The Department of Statistical Sciences Student Travel Award is available to all enrolled graduate students. This Award is intended to enable students to present their work, papers & publications and/or participate in a poster session at a conference and/or workshop. Funding and details of how to apply will be announced by the Associate Chair, Graduate Studies. The School of Graduate Studies also offers an award intended for students who are presenting their research for the first time at a conference.

USEFUL CONTACTS

Academic Success Centre http://www.asc.utoronto.ca/	**416-978-7970**
Awards for PhD Students http://www.utstat.toronto.edu/wordpress/?page_id=423	**NA**
Awards for MSc Students http://www.utstat.toronto.edu/wordpress/?page_id=423	**NA**
Bookstore(UofT) http://www.uoftbookstore.com	**416-640-7900**
Campus Police (Emergency: 978-2222) http://www.campuspolice.utoronto.ca	**416-978-2323**
Centre for International Experience http://cie.utoronto.ca/	**416-978-2564**
Community Safety Office http://www.communitysafety.utoronto.ca	**416-978-1485**
Counseling and Psychological Services (CAPS) http://www.caps.utoronto.ca/main.htm	**416-978-8070**
Accessibility Services http://www.accessibility.utoronto.ca/Volunteer-Note-taking.htm	**416-978-8060**
Gerstein Science Information Centre http://www.library.utoronto.ca/gerstein	**416-978-2280**
Graduate Student's Union http://www.utgsu.ca	**416-978-2391**
Health Service http://healthservices.utoronto.ca/Main.htm	**416-978-8030**
Lost and Found (St. George Campus) http://www.fs.utoronto.ca/caretaking/lost.htm	**416-978-6252**
Mathematics & Statistics Library (BA 6141) http://www.library.utoronto.ca/math/	**416-978-8624**
MITACS – Accelerate Award http://www.mitacs.ca	**647-478.5904**