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I) INTRODUCTION TO THE DEPARTMENT

The Department of Statistics at Northwestern University offers a program leading to the Doctor of Philosophy degree. The doctoral program in statistics is designed to provide students with comprehensive training in statistical theory and methodology and in the application of statistical methods to problems in a wide range of fields. The program is flexible and may be arranged to reflect students' interests and career goals. Cross-disciplinary work is encouraged. The PhD program prepares students for careers as university teachers and researchers and as research statisticians in industry, government and the non-profit sector. A Master’s degree program is available to students in doctoral programs in Economics, Political Science, Sociology, Psychology, Learning Sciences, and Human Development & Social Policy in the University. Students in these departments should consult their DGS as well as the DGS for Statistics before considering the MS. Students in the doctoral program in Statistics may also earn a Master’s degree in Statistics en route to the PhD.

The department is distinguished by the faculty's strong interest in both statistical theory and the application of statistics to such diverse areas as public policy, law, medicine and life sciences, and social sciences. Interest in cross-disciplinary work has always been strong – when the department was formed, in the 1980s, all of the founding members of the department had appointments in other departments including from management, engineering, mathematics, education and social policy, sociology, and psychology. The graduate programs offer substantial training in statistical applications and methodology, as well as current advances in statistical theory and computation. Other relevant information can be found in the Department website: http://www.statistics.northwestern.edu.

II) REQUIREMENTS FOR THE PHD DEGREE

The Graduate School has general requirements for the PhD students at NU, which can be found at http://www.tgs.northwestern.edu/studentsvcs/doctoral/. Students are required to fulfill the Department requirements in addition to those specified by The Graduate School.

A. Requirements of coursework for MS degree en route of PhD study

Students admitted to the PhD program can obtain an optional Master of Science (M.S.) degree en route. The M.S. degree requires 12 courses. Required courses include STAT325 (Survey Sampling), STAT350 (Regression Analysis), STAT351 (Design and Analysis of Experiments), STAT420-1, 2, 3 (Introduction to Statistical Theory and Methodology I, II, III). The remaining courses should be chosen from other 300- and 400-level courses in Statistics, which should include at least two 400 level courses. Approved courses in other departments may also be taken; however, no more than 3 non-statistics courses may be used to fulfill the degree requirements.

B. Additional coursework for PhD students

In addition to the 12 courses listed above, PhD students must take either MATH450-1, 2 (Probability I, II) or MATH450-1 (Probability I) and IE/MS460-1,2 (Stochastic Models I, II). Typically students complete all required coursework in the first two years.

C. Language requirement

All new PhD students whose primary language is not English must pass the spoken English test by the Graduate school during their first-year study. Students who fail to pass this exam by the end of first year study are not eligible for being teaching assistants, and thus will not be financially supported by the Department starting in the second year of PhD.
study. All international PhD students whose primary language is not English will be required to take the Versant English Test after arriving at Northwestern. A minimum score of 65 out of 80 is required to pass the exam. Students who fail the Versant exam will need to take the SPEAK test administered by the Linguistics Department in a later quarter. Additional details can be found at http://www.tgs.northwestern.edu/financial-aid/graduate-assistantship/.

D. Teaching requirement

Teaching assistant responsibilities may include attending classes, holding office hours, constructing and administering exams, grading exams and papers, providing guest lectures, and/or leading discussion sections. Including time spent attending classes, teaching should average less than 15 hours of work per week.

E. Milestones and timeline

The Department has specific requirements for milestones and their timeline, some of which are different from the general guidelines provided by the TGS for PhD students.

1. Qualifying exam

All PhD students must pass a comprehensive exam (also termed the qualifying exam) in the beginning of second year of PhD study. This exam will cover the contents of the six core courses listed in part A above. This is also one of the requirements for obtaining M.S. degree en route of PhD study in addition to the course work.

2. Prospectus (by the end of third year)

Students in the statistics PhD program must be admitted to PhD candidacy by the end of year 3. In addition to completion of all coursework requirements listed in Part A and B, and passing the qualify exam, students must pass a prospectus examination, normally taken in the third year of residence (including summer), on a topic of their choice. The prospectus is the proposal of dissertation, which should include a detailed literature review, preliminary results and a well-thought research plan. Note that statistics department requires that students must complete their Prospectus (proposal of dissertation topic) before the end of year 3, which is an earlier than The Graduate School deadline of the end of year 4 (See http://www.tgs.northwestern.edu/studentsvcs/doctoral/prospectus/). Students may apply for extension of prospectus, and extension is only granted to students who cannot complete it before the deadline but have demonstrated good progress in completing the prospectus. In all circumstances, the prospectus must be completed by the end of fourth year. Failure to comply with this deadline will result in exclusion from the PhD program. The student should submit the written prospectus at least two weeks before the exam. In addition, the student should submit the prospectus TGS Forms in CAESAR before the exam, and DGS will approve it online if the student passes the exam.

3. Residency and full-time status

A full-time PhD student must complete eight quarters of residency consecutively over two years, including summers (http://www.tgs.northwestern.edu/academics/academic-services/phd/residency-transfer/index.html). To be a full-time student, no fewer than three courses (and no more than four) authorized for graduate credit must be registered per quarter. Students may register for STAT590 (Research) to maintain full-time registration during quarters in which they are not enrolled in graded coursework, for example during the summer months. Note that full-time status is required in order to receive financial support of any kind or to maintain a valid visa status (e.g. F-1, if it applies). If all coursework has been completed, or the registered courses (required or non-required) are less than 3 units students may register for TGS500 to maintain the full-time status.

4. PhD Dissertation
The dissertation must demonstrate an original contribution to a chosen area of specialization. A final examination (thesis defense) is given based on the dissertation. The presentation typically lasts around 50 minutes. About 15-30 minutes should be given for questions and committee discussion. The student should print out the TGS final examination form before defense and bring it to the exam. If he/she passes the exam, signatures of approval should be collected from the committee members and the signed form should be delivered to the DGS. The DGS will approve it online and send the hard copy and scanned electronic version to TGS. Once the dissertation is approved by the thesis committee and all edits and revisions are complete, the student should submit it online for archiving via ProQuest.

5. Graduation

The PhD degree is awarded in December, March, June, and August. Students should refer to the TGS PhD Degree Completion pages for information on filing requirements and deadlines.

6. Degree deadline

Students have 9 years from matriculation to complete the PhD degree. Only very rarely under extreme extenuating circumstances will students be granted permission to continue beyond 9 years.

F. Course registration

All students register online through CAESAR. Registration dates are posted at Office or Registrar’s Website for each quarter. It is the student’s responsibility to comply with all deadlines to complete registration each quarter. In the case that a student has difficulty registering, he/she may contact Student Services via e-mail. For courses that require a program’s consent, students should contact the department that offers the course to obtain a permission number.

Summer registration

Summer registration is required for all PhD Students in their first and second year study to meet the residency requirement. Students in their third year or beyond are required to register in the summer if they receive funding support from the University.

Approval of course registration

In addition to the required courses, the Department encourages students to take non-STAT courses that are related to their thesis research. Students are required to consult with their academic advisor or thesis advisor to obtain approval for course registration each quarter. Taking non-STAT courses (except those required in Part B) without approval from the Department may result in termination of financial support. Additional rules are given in TGS guidelines.

G. Advisor and thesis committee

Upon arrival at the Department, each new PhD student will be assigned with a temporary academic advisor. The temporary advisor will provide the new student with general advice on course registration and other issues before the student selects the thesis advisor. The thesis advisor should be a faculty member or affiliated member of the Department of Statistics. Students should begin to think about selection of their thesis advisor starting in the later quarters of the first year. The students learn about the expertise of each faculty member from the faculty member’s personal webpage, from conversations with more senior students or by taking an independent study course (STAT499) with the faculty member. It is not uncommon for a student to take multiple independent study courses with different faculty members before he/she makes a decision on whom to work for the dissertation. It is expected that each student has selected the thesis advisor by the end of second year.
The thesis committee should consist of at least three faculty members, at least two of whom (including the chair) should be faculty members in Statistics or affiliated with Statistics. In addition to the major advisor, one committee member could also serve as co-advisor. Students often find it beneficial to include committee member(s) from outside Department, whose expertise is related to the thesis research. A thesis committee must be formed before the prospectus examination.

III) REQUIREMENTS FOR THE MS DEGREE FOR PHD STUDENTS IN OTHER DEPARTMENTS

The Department offers an MS degree in Statistics for doctoral students in Economics, Political Science, Sociology, Psychology, Learning Sciences, and Human Development & Social Policy who wish to establish their qualifications in statistics and quantitative research methodology. Students will be expected to take a total of 9 courses in a program to be approved by the program director. Two of these courses (STAT320-1, 2) will ordinarily be required of all students to provide a foundation in statistical theory. Students should also complete 7 other courses selected with the advice and approval of the program director, at least two of which must be taught in the Department of Statistics. Note that the program may be completed entirely from courses taught in the Statistics Department, but may include up to 4 courses from departments other than Statistics with the approval of the program director. No comprehensive exam or thesis is required. A tentative list of the courses includes:

Statistics

STAT320-1, 2 (Statistical Methods I, II, required)
STAT320-3 (Statistical Methods, III)
STAT325 (Survey Sampling)
STAT328 (Causal Inference)
STAT344 (Statistical Computing)
STAT345 (Statistical Demography)
STAT348 (Applied Multivariate Analysis)
STAT350 (Regression Analysis)
STAT351 (Design and Analysis of Experiments)
STAT355 (Analysis of Qualitative Data)
STAT352 (Nonparametric Statistical Methods)
STAT354 (Applied Time Series Modeling and Forecasting)
STAT356 (Hierarchical Linear Models)
STAT439 (Meta-Analysis)

Economics

ECON380-1, 2 (Introduction to Mathematical Economics I, II)
ECON381-1, 2 (Introduction to Econometrics I, II)
ECON401 (Mathematical Methods of Economic Theory)
ECON 4801, 2, 3 (Introduction to Econometrics I, II, III)
ECON481-1, 2, 3 (Econometrics I, II, III)
ECON483 (Applied Econometrics: Cross Sectional Methods)

Epidemiology and Biostatistics

EPI BIO501 (Advanced Epidemiology)
EPI BIO502 (Advanced Biostatistics)

Political Science

POLI SCI405 (Linear Models)
POLI SCI406 (Econometrics)
POLI SCI407 (Experimental Political Science)

Psychology

PSYCH405 (Psychometric Theory)

Sociology

SOCIOL404 (Designs for Descriptive Causal Research in Field Settings)
SOCIOL402 (Event History Analysis)
SOCIOL476 (Statistical Methods for Hierarchical and Panel Data)

IV) STUDENT AFFAIRS

A. Academic standing

Every student must maintain a satisfactory academic standing by meeting the standards of the Department and The Graduate School. The general requirements for good academic standing can be found at TGS website. Each student’s academic progress must be reported annually by the student’s program to the student and to TGS. In addition to TGS criteria, the Department regards the student to have unsatisfactory academic standing if the student: 1) has an overall grade average below B (3.0 GPA) in any quarter; 2) fails the qualifying exam; 3) fails to complete the prospectus exam by the end of third year (without receiving approval from the Department for an extension); 4) fails to complete the prospectus exam by the end of fourth year; 5) does not make satisfactory progress in research.

Evaluation: The Department conducts an annual review of each student’s academic progress, and a written report will be sent to the student and to TGS by the end of summer quarter. In addition, the Department conducts informal evaluations of each student in each quarter. Students with unsatisfactory academic standing will be notified.

Probation: A student who is in unsatisfactory academic standing because of 1, 3, or 5 will be placed on probation. When a decision to place a student on probation is made by the program, the student and The Graduate School must be notified in writing.

Exclusion: A student who is on probation because of 1, 3, or 5 will be re-evaluated at the end of probation period. If no satisfactory progress is made, the student will be excluded from the PhD program (The University defines exclusion in the Student Handbook). A student who does not make satisfactory progress because of 2 or 4 will be excluded from the PhD program. When a decision to exclude a student is made by the program, both the student and TGS will be notified in writing within five business days of the decision. The exclusion (dismissal) notification will include the effective date of the exclusion and a clear statement of the reason(s) for exclusion.

Appeal: A student can appeal a program’s exclusion decision to The Graduate School. Students should submit the written request to the attention of the Director of Student Services within ten days of the date of the program’s written notice of exclusion with supporting materials. If the appeal is not filed within 10 days, the Department decision becomes final and not subject to appeal.

B. Academic integrity

Academic integrity is critical to any scholarly activities. Principles regarding academic integrity can be found on TGS website and on the Office of the Provost website. Violation of these rules may result in a range of sanctions, possibly including exclusion from the program.

C. Improper conduct
All graduate students should abide by Northwestern rules on discrimination, harassment and sexual harassment explicitly defined at http://www.northwestern.edu/sexual-harassment/discrimination/index.html. Any graduate student who believes that he/she is the subject of violations of these rules should contact one of the individuals listed under “Where to Get Advice and Help.”

D. Conflict resolution

If conflicts arise that do not involving discrimination, harassment or sexual harassment, TGS recommends that students should first talk to the DGS of the department. If DGS has conflict of interest, the student should talk to the Department chair. If the student cannot or does not want to talk to the DGS or department Chair, he/she could also directly talk to the Associate Dean for Student Affairs, William J. Karpus. Additional helpful information can be found at TGS website http://www.tgs.northwestern.edu/graduate-life/dealing-with-conflict/.

V) GRADUATE STUDENT LIFE

A. Funding and Duties

Statistics PhD students are typically supported through University fellowships, teaching assistantships and research assistantship. Students are guaranteed funding for five academic years and four summers (not the last year summer) provided that the student maintains satisfactory academic standing. PhD students are typically supported by a university fellowship in their first year (including summer) and fifth year (no summer) to help students concentrate on core coursework and the dissertation, respectively. In some cases, a student may obtain financial support in the sixth year or the summer of fifth year through a faculty member’s research fund or from the Department if a TA position is available, provided that the student has been making satisfactory academic progress.

PhD students are strongly encouraged to apply for external grants during their doctoral careers. Receipt of external awards is a significant advantage in their career development. In addition, students receiving external funding may get supplemental pay in addition to their university base salary (see TGS policies regarding this).

**Summer fellowship**: Summer fellowship support is contingent upon an approved proposal for summer study (in addition to satisfactory progress toward the PhD degree). Students who will be on a summer fellowship should submit a proposal for summer research before summer quarter starts. The student should consult with his/her academic advisor or a professor for a summer research topic. By the end of summer, the students should submit a report summarizing their summer research to the Director of Graduate Study.

Students in their third or later year in the program may take a summer internship in industry. Summer fellowships are only awarded to students who work on research full time. Thus students taking a summer internship should not register for STAT590 or TGS500 and are not eligible for summer fellowship. Students who plan to work on an internship in the summer are responsible for notifying the Department as soon as this information is available, normally well in advance of the end of spring quarter. Failure to report this may be regarded as improper conduct.

B. Life on campus

**WildCARD**

Each student will be assigned an identification number and issued a campus WildCARD. The WildCARD can be used to access University buildings, shuttles, library and other facilities. It can also be used to purchase food at vending machines or university meal plan with discounts. The WildCARD office is located in the basement of Norris center. http://www.northwestern.edu/uservices/wildcard/.

**NetID**
The NetID is a student’s electronic identity at Northwestern. You will use your NetID to access important University systems including, but not limited to (http://www.it.northwestern.edu/netid/overview.html):

- University e-mail
- NU online directory
- NU Library online resources
- Grades and transcripts (CAESAR)
- Kronos Time System
- Campus wireless network
- Off-campus access to the NU Network (VPN)

Parking and transportation:

All vehicles parked on the Evanston campus must display a valid parking permit. Yearly or temporary parking permits can be purchased at Evanston parking office located at 1819 Hinman Avenue, Evanston, IL 60208-1320.

NU provides shuttle bus service on the Evanston and Chicago campuses, as well as an intercampus shuttle between the two campuses. All NU students have free access to the shuttle bus, obtained by showing a WildCARD. Other public transportation from Evanston to Chicago, as well as other destinations, include CTA and Metra. All full-time students enrolled in The Graduate School (TGS) are eligible for a U-Pass for CTA service, with the exception of those enrolled in TGS 512 (continuous registration), 513, 514, 510 (Co-op internship), 410, 411, 412, and 412.

Housing:

NU provides convenient on-campus apartments for graduate students. Engelhart Hall, located at 1915 Maple Avenue in Evanston, is a University-operated residence hall for graduate students. Seabury Apartments are located at 600 Haven Street, Evanston. TGS is working with the University Housing office to offer priority applications to Seabury for students who are parents. Helpful information for off-campus apartments is also available at http://www.northwestern.edu/offcampus/.

Immigration status

International students are required to maintain a legal immigration status while they pursue PhD study in the United States. For all full-time international students (F-1/J-1 visa holders), working off-campus must be approved by the International office before they start to work. Failure to comply with this may result in exclusion from the program and termination of F-1/J-1 visa status. When working on-campus F-1/J-1 students are allowed to work up to 20 hours per week while school is in session, and 20 or more hours per week during school breaks and holidays.

Purchasing

NU has free and discounted software licenses for graduate students. Preferred vendors and other purchase resource can be found at http://www.northwestern.edu/uservices/purchasing/.

VI)  GRADUATE STUDENT CAREER DEVELOPMENT

A. Teaching skills
Teaching is an important element in graduate training. NU provides training to teaching assistants by TA conference and graduate workshop. For advanced graduate students, NU provides a teaching certificate program through the Searle Center for Advancing Learning and Teaching. New TAs are required by the Department to attend the new TA conference. Advanced graduate students are strongly encouraged to participate in the teaching certificate program to develop teaching skills.

B. Department seminar

The Department has a biweekly seminar. Students are expected to attend all Department seminars; students should also take advantage of any opportunity to meet with a seminar speaker.

C. Conferences

The Department strongly encourages students to attend professional conferences. A student who is presenting his/her research work in a conference may apply for a TGS travel grant. Students are eligible for a maximum of two grants up to $600 per trip. Students should apply at least 30 days prior to their first date of travel. The Department also contributes up to $300 to students’ travel during their entire student career at Northwestern. Additional guidelines can be found at TGS website.