I. Course Requirements

Required Courses:

- Statistics 709 and 710 (Mathematical Statistics)
- Mathematics/Statistics 831 (Measure Theoretic Probability)
- Statistics 849 and 850 (Statistical Methods and Applications)
- Statistics 998 (Statistical Consulting)

Elective Courses: The student must earn at least eighteen credits from the following courses:

- Stat 641 - Statistical Methods for Clinical Trials
- Stat 642 - Statistical Methods for Epidemiology
- Stat 701 - Applied Time Series Analysis, Forecasting & Control I
- Stat 702 - Applied Time Series Analysis, Forecasting & Control II
- Stat 732 - Large Sample Theory of Statistical Inference
- Stat 741 - Survival Analysis Theory & Methods
- Stat 749 - Mathematical Models & Response Surface Methodology
- Stat 750 - Theory of Linear Models
- Stat 751 – Sequential Analysis
- Stat 760 - Multivariate Analysis
- Stat 761 - Decision Trees for Multivariate Analysis
- Stat 768 – Statistical Methods for Medical Image Analysis
- Stat 771 - Statistical Computing
- Stat 775 - Introduction to Bayesian Analysis
- Stat 803 - Experimental Design
- Stat 809 - Nonparametric Statistics
- Stat 811 - Sample Survey Theory & Methods (formerly 611)
- Stat 824 - Nonlinear Regression Analysis with Engineering Applications
- Stat 826 - Theory of Life Testing & Reliability
- Stat 829 – Decision Theory
- Stat 832 - Theory of Probability (math)
- Stat 834 - Intro to empirical processes and semiparametric inference
- Stat 840 - Statistical Model Building and Learning
- Stat 841 - Nonparametric Statistics and Machine Learning Methods
- Stat 842 – Hypothesis Testing
- Stat 851 - Generalized Linear Models
- Stat 853 - Bayesian Inference
- Stat 860 - Estimation of Functions from Data
- Stat 877 – Statistical Methods for Molecular Biology
- Stat 992 - Special topics
A grade of B or better must be received in any course used to fulfill the required and elective course requirements.

A maximum of nine credits of Statistics 992 may be applied to fulfill the elective course requirement with a maximum of three credits on any one topic. Given compelling justification, the Curriculum and Degree Requirements Committee can rule, on a semester by semester basis, that other Statistics courses or courses outside of the Statistics Department can be used to fulfill the elective course requirement.

With the approval of the Curriculum and Degree Requirements Committee, courses taken elsewhere or equivalent material learned elsewhere may be used to fulfill the above requirements. Approval must be requested within the first two semesters of registration as a graduate student in the department.

2. Qualifying Examination

The student must pass the Ph.D. Qualifying Examination within six semesters from the first fall semester of registration as a graduate student in the Department. The examination may be attempted a maximum of two times.

Masters degree students who successfully complete the Department’s M.S. exam within four semesters and are then admitted to the Ph.D. program shall be granted a two-semester extension to the time limits for passing the Ph.D. Qualifying Examination.

The examination is written and is based on a syllabus made available by the Ph.D. Qualifying Examination Committee. A reading list containing references discussing material on the syllabus is also available. Most or all of the syllabus material is covered in the required courses, 709, 710, 831, 849, 850.

The written examination is given during the first or second week of classes in each semester and is administered on two days. The first day covers Mathematical Statistics and is based on the material of 709 and 710; typically the student must answer three questions from a list of four. On the second day the student must answer two questions from a list of four containing two questions based on material from 849-850 and two questions based on material from mathematical distribution theory and probability (709 and 831).

Passing or failing this examination will not affect the student’s candidacy for the Master’s Degree.

3. Preliminary Examination

The student must pass an oral preliminary examination on a topic selected with the approval of the student’s advisor. The examination is given by a committee of at least four faculty members appointed by the advisor. Prior to the actual examination, the student must prepare a 15 to 20 page paper outlining the area to be covered. The paper must be written in a clear style with consistent notation. The paper should indicate the scope and depth of the examination, and should be submitted to the committee at least one week prior to the examination.

The examination consists of a 20 to 30 minute talk by the student and questions by the committee. The committee may ask questions during and after the talk. The student may consult notes, but is expected to display a mastery of the subject matter as defined by the list of references. The scope of the questions will normally be directed to the subject matter of the paper but may, by natural extension, include any relevant topic. The student’s advisor may not serve as chair of the committee, but does appoint the chair.

Three weeks before the scheduled Preliminary Examination, a Request for Preliminary Warrant should be sent to the Graduate School. Upon review, the Graduate School will return the warrant to the graduate coordinator for committee members to sign after the examination.
4. Dissertation

The primary requirement for the Ph.D. degree is the completion of a significant body of original research and the presentation of this research in a dissertation. The research is carried out under the guidance of a member of the Department. The candidate must defend the dissertation in a final oral examination.

At least three weeks prior to the final oral examination, the student must submit a "Ph.D. Final Oral Committee Approval Form" to the Graduate School. Upon review, the Graduate School will return a packet to the Graduate Coordinator, including the warrant to be signed by the Committee and Department Chair.

Students are responsible for ensuring that they meet Graduate School requirements and deadlines. http://info.gradsch.wisc.edu/admin/academicservices/ddd.html

5. Breadth Requirements

There are three options that fulfill the breadth requirement. For all options, students must complete PhD Breadth Requirement form and have it signed.

Option A (External): Fulfill the minor requirement as specified by another department or program other than Statistics. Students should contact the individual department or program for details.

Option B (Distributed minor):

- At least 9 credits in one or more departments other than Statistics.
- At least 3 credits must be from courses numbered 600 or higher.
- Some courses numbered lower than 600 may not be included*.
- Any course covering the same material as existing courses in Statistics cannot be included* except that at most one course cross-listed with Statistics may be included if it is not staffed by the Statistics department. (* The Department maintains a list of such courses. For example, the following courses are not included: all courses 300 or below, CS 302, CS 367, Math 521, Math 522, Econ 709, Econ 710.)
- Courses must be completed with grades BC or higher with an average of B or higher.

Option C (Breadth): Fulfill at least two of the following three:

- **Participatory seminar experience**: Take two one-credit seminar courses outside of the Statistics and Biostatistics and Medical Informatics (BMI) departments. These must involve some level of active participation, such as an oral presentation or written report.
- **Collaborative research experience**: This provides students with direct experience in interdisciplinary collaborative research activity under the guidance of a faculty trainer. The student must report the results of this activity in an advertised seminar. Students may fulfill this requirement by rotating through directed study/research credits with Statistics or Biostatistics degree option faculty trainers, or with faculty from other departments.
- **Breadth course**: Take a 2-3 credit graduate course outside of the Departments of Statistics or BMI. This must be at or above the 600 level, or be from the approved list of outside courses for the Biostatistics Degree Option.

For option B, the student must complete a PhD Minor Agreement Form signed by the student's advisor and the Department Minor Advisor before starting the second minor course.

For option C, the student must present a tentative proposal signed by student's advisor and the Department Breadth Advisor before starting the second part of this option. The student must write a letter to the Chair of the Curriculum and Degree Requirements Committee (CDRC) detailing how the requirements are fulfilled and submit with PhD Breadth Requirement form.

Students who do not yet have a major professor and who want some preliminary advice on the kinds of programs likely to be approved may speak with a Graduate Advisor for New Students.
6. Residence Requirements

A Ph.D. degree requires 32 graduate credits (300 level or above, no audits or pass/fail) taken as a graduate student at UW-Madison.

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