

## Program Policy Statement – Statistics

### Part I. Program History

- A. Statement of purpose and expectation of graduate study in the program.  
The Statistics M.S. Program, provides a balance of a foundation in theoretical statistics, applied coursework in statistical techniques, and opportunities for application of statistical knowledge through the StatLab and internships with local companies. Students completing the M.S. degree in Statistics will:
1. Have a theoretical foundation in probability, mathematical statistics, and optimization.
  2. Have a core set of coursework in practical applications in regression, design of experiments, and multivariate methods
  3. Have exposure to Statistical Consulting.
  4. Have an opportunity to apply the course work in a thesis, applied research, or an internship.
- B. Date of Permanent Status (or current status).  
The Statistics Program moved from the Department of Mathematical Science to the Department of Food and Resource Economics, College of Agriculture and Natural Resource in Fall, 1999
- C. Degrees offered (include brief description of concentrations, fields, etc.).  
M.S. In Statistics  
**M.S. in Statistics with a Concentration in Decision Analysis**

### Part II. Admission

- A. Admission Requirements (be specific about GRE, GMAT, and TOEFL Scores, G.P.A and others).  
On a 4.0 system, applicants should have a G.P.A. of at least 2.5 and an average of at least 3.0 in mathematics and related areas. Applicants who have completed an advanced degree must have done so with a G.P.A. of at least 3.0. In addition, applicants must take the GRE Aptitude Test with at least a score of 1050 in quantitative math and verbal (with an emphasis on the quantitative) for the traditional test. Students taking the new GRE exam should have a minimum of 300 combined on verbal and quantitative reasoning. Students for whom English is not their first language must meet a minimum of 85 on the TOEFL IBT examination. Admission to the Statistics Program is based on selections made by the department graduate committee in compliance with University policies and procedures. Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

- B. Prior degree requirements.  
Candidates for admission to the statistics program need not have majored in any specific undergraduate field as a prerequisite for admission. However, competence is expected in linear algebra, differential equations, advanced calculus, and computer programming.
- C. Application deadlines.  
Fall: February 1 (international applicants) & July 1  
Spring: December 1  
Summer: Not applicable at this time
- D. Special competencies needed (i.e., specific courses or experience). n/a
- E. Admission categories (explain other than regular such as provisional).
1. REGULAR STATUS: is offered to students who meet all of the established entrance requirements. Individuals who apply during the final year of undergraduate or current graduate work and are unable to supply transcripts showing the conferral of the degree will be admitted pending the conferral of the degree. Evidence of the earned degree must be provided prior to the first day of classes in the term of admission.
  2. CONDITIONAL ADMISSION: is offered when transcripts or test scores must still be verified by the Office of Graduate and Professional Education. The conditions of acceptance must be satisfied within the first semester of coursework.
  3. PROVISIONAL ADMISSION: is offered to students who are seeking admission to a degree program but lack specific prerequisites needed in the major department. Students with provisional status are not eligible for assistantships or fellowships until the provision has been met.
  4. NONDEGREE ADMISSION: may be offered to students who apply too late to submit standardized test scores but have supplied an official transcript. Test scores must be submitted and accepted by the department by the end of the first semester to be eligible to continue in a degree program.  
Nondegree status is also offered to students who wish to work to earn graduate credit with graduate status but do not intend to work for a degree (e.g., certificate programs). Transcripts and GRE scores are required for admission.
  5. VISITING SCHOLAR ADMISSION: is offered to students who wish to transfer graduate credits to another institution. A letter from the student's graduate dean or registrar certifying good academic standing is accepted in lieu of the transcripts and GRE scores. Visiting scholar status is generally limited to a period of two years and is a non-degree status.
- F. Other documents required (i.e., letters of recommendation, essays, portfolios, interviews, writing assessments, etc.).

Transcripts, letters of recommendation, essays, resume.

- G. Must include University statement: Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

### **Part III. Academic**

#### **A. Degree Requirements**

The total credits required for the degree are 33.

21 credits of core and 12 credits of electives:

Statistics M.S. Core requirements (21 credits)

- STAT 601 Probability Theory for Operations Research and Statistics
- STAT 602 Mathematical Statistics
- STAT 603 Vector Spaces and Optimization
- STAT 611 Regression Analysis
- STAT 615 Design and Analysis of Experiments I
- STAT 617 Multivariate Methods
- STAT 641 Statistical Laboratory

Additional Approved Course (3 credits)

In addition, students must take one elected course from an Approved List of Courses maintained by the Department. These include:

Signature Courses (6 credits)

- STAT 612 Advanced Regression
- STAT 616 Advanced Design of Experiments
- STAT 620 Nonparametrics
- STAT 621 Survival Analysis

Optional Courses (9 Credits)

Three STAT 600 level courses with the exception of: STAT 608, STAT 609, STAT 613, STAT 670, and STAT 671, which were designed for nonmajors. Key approved optional courses include: STAT 656 Biostatistics; STAT 674 Data Management; STAT 675 Logistic Regression;

Or One Optional Course and 6 Thesis Credits (STAT 669) (9 credits)

Or One Optional Course and 6 Internship Credits (STAT 664) (9 credits)

Students are expected to participate in StatLab; attend departmental seminars, attend the monthly meetings of the Delaware Chapter of the American Statistical Society; and area professional meetings, such as the ASA Meetings or the Merkle-Temple Conference. The Department provides support for graduate students for these activities.

A student may request additional coursework be counted from a previous degree or from another institution and department. Partitions are presented to the Chair who renders a decision after consultation with the Graduate Committee and relevant faculty. A minimum GPA of 3.0 is required for this program.

The following Non-STAT Major Courses do not apply to the STAT M.S. degree.

STAT 608 - Statistical Research Methods

STAT 609 - Regression and Experimental Design

STAT 670 - Introduction to Statistical Analysis I

STAT 671 - Introduction to Statistical Analysis II

STAT 613 - Multivariate Statistical Methods with Biology Applications

Students are expected to be able to present their results of statistical models of the design of an experiment in report and presentation forms and various classes require these forms of expression as part of the evaluation. Most internship opportunities will require student to prepare reports and make presentations.

#### Concentration in Decision Analysis.

Students wishing to build a concentration in Decision Analysis can build additional skills in operation research mathematical modeling that would compliment the statistics courses. The number of credits remains at 33 and the core courses in the M.S. Statistics are the same with the exception of STAT 603 is optional. In addition, in place of the Signature Courses there are four operations research courses. Students declaring the Decision Sciences concentration in the Operations Research M.S. degree will take the following.

#### Statistics M.S. Core requirements (18 credits)

- STAT 601 Probability Theory for Operations Research and Statistics
- STAT 602 Mathematical Statistics
- STAT 611 Regression Analysis
- STAT 615 Design and Analysis of Experiments I
- STAT 617 Multivariate Methods
- STAT 641 Statistical Laboratory

#### Decision Analysis Concentration (9 credits)

- ORES 601 Survey Operations Research I or ORES 801 Math Programming with Economic Applications
- ORES 602 Survey Operations Research II
- ORES 603 Simulation Modeling and Analysis

#### Additional Approved Courses (6 credits)

Two STAT 600 level courses with the exception of: STAT 608, STAT 609, STAT 613, STAT 670, and STAT 671, which were designed for nonmajors. Key approved optional courses include: STAT 656 Biostatistics; STAT 674 Data Management; STAT 675 Logistic Regression;

or 6 Thesis Credits (STAT 669) 6 credits

or 6 Internship Credits (STAT664) 6 credits

B. Committees for exams or thesis

New students, as part of the usual orientation program, will meet with the Department Chair and the Chair of the Graduate Committee until an advisor is assigned. Thereafter the student will meet with their advisor to plan their first year of study in the program. Advice will be given concerning course selection based on interests and undergraduate/graduate background. Our program is sufficiently small that we are able to give individualized attention to graduate students. Added features of the program are internship possibilities and the Statistical Consulting Laboratory. The authority for administering the program rests with the Graduate Committee. The advisor helps students formulate a plan of study through meetings with individual graduate students. These meetings occur twice yearly before the beginning of each preregistration period.

C. Timetable and definition of satisfactory progress towards the degree

Most graduate students will take 10 credits as full-time students, particularly in the first year. This involves three graduate three-credit courses and a one-credit StatLab. In the second year, when most students are interning, students generally take two classes plus a three-credit Internship credit. Grade requirements (general and specific): A minimum GPA of 3.0 is required to remain in good standing.

### **Academic Good Standing**

To be considered in good academic standing, a student must maintain a minimum cumulative graduate grade point average (GPA) of 3.00 on a 4.00 scale each semester. To be eligible for an advanced degree, a student's cumulative grade point average shall be at least a 3.00 and the student's grades in courses counted toward the degree requirements of the program shall equal at least a 3.00. A grade below a C- will not be counted toward the course requirements for a degree but is calculated in the student's cumulative grade point average.

In addition to the University's definition of good standing, some programs may also require minimum grades in specific courses in the program. These courses are identified in each program's policy and procedures manual and these unit-specific requirements have been approved by the Faculty Senate.

Performance in graduate lecture courses and seminars is evaluated according to the University's Grading Policy. When the work required in research (868, master's thesis 869, or special problem 866) extends beyond the regular semester period, temporary grades of "S" and "U" should be recorded. Final letter grades are to be recorded only at the completion of the project.

### **Academic Deficiency And Probation**

The Office of Graduate and Professional Education monitors the academic progress of all graduate students and notifies students in writing of all academic deficiencies. The cumulative GPA after each 9-hour increment determines academic standing. (See chart below.)

Any status (or clear) 3.0 or above Clear

Clear 2.99-2.5 Warning

Clear 2.49-2.0 Probation

Probation Below 3.0 Dismissal

Warning Below 3.0 Probation

Any status Below 2.0 Dismissal

In addition to the University policy regarding minimum grade point averages, some departments require graduate students to maintain certain performance minima in their programs of study in all or in particular courses. Failure to meet the stated minima may lead to academic dismissal from the program.

### **Graduate Studies Academic Probation Policy**

The University's Academic Probation Policy is expressed in the following:

The Office of Graduate and Professional Education notifies students when they are dismissed from graduate programs without completing a degree. Dismissals usually take place at the end of a term. Students may be dismissed for the following reasons:

- Upon the expiration of the five-year time limit for master's degree programs or for those students in a doctoral program who were admitted with a master's degree. Upon the expiration of the seven-year time limit for doctoral students who were admitted without a master's degree.
- Upon the failure to meet the grade point average requirements as stated in the policy on Academic Deficiency and Probation.
- Upon written notice to the Office of Graduate and Professional Education of voluntary withdrawal from the program.
- Upon failure to pass the preliminary, language, or comprehensive/candidacy examination(s), a thesis/executive position paper proposal defense, or a thesis/executive position paper defense.
- Upon the failure to achieve a cumulative grade point average of 3.0 upon the completion of the stated number of required credits for a degree.
- Upon the failure to meet the stated minima in specific course requirements as identified by individual programs when a department has a policy that such failure leads to dismissal from the program.

- Upon failure to satisfactorily conduct research required for the degree.

Upon the determination by the faculty of the student's department that the student has failed to meet or has failed to make satisfactory progress towards meeting academic standards required of the student's program other than the failure to achieve a cumulative grade point average of 3.0 upon the completion of the stated number of required credits for a degree.

At the close of each semester, winter session or summer session, in those circumstances deemed appropriate by the department or program faculty exercising its professional judgment, the faculty of each department or program may evaluate the progress of a graduate student toward meeting the academic standards of the program in which the student is enrolled. In addition to graded course work, academic standards include, but are not limited to, professional, ethical, clinical and other standards required of graduate students.

Students are entitled to know the procedures and standards by which their academic performance is assessed. Each program has a statement of policies and procedures by which student academic progress is monitored and by which comprehensive, qualifying, and final examinations/defenses are conducted and graded. If, in the professional judgment of a department or program faculty, a student has failed to make satisfactory progress toward meeting the academic standards of the program in which that student is enrolled, the faculty may vote to dismiss that student from the program.

In the case of dismissal, the program director is required to send a report to the Office of Graduate and Professional Education that states the faculty vote on the decision causing dismissal and the justification for this action. The Office of Graduate and Professional Education will notify a student in writing when the student is being dismissed for failure to make satisfactory progress in the program.

In the case of academic dismissal, the student may appeal the termination by writing to the Office of Graduate and Professional Education. This appeal must be made within ten class days from the date on which the student has been notified of academic dismissal. If the Vice Provost grants reinstatement, the student must meet the conditions of the reinstatement. Failure to meet these conditions will result in dismissal from the program. A graduate student may be reinstated only once to a given major. The student's academic transcript will reflect the reinstatement with academic probation status.

## **Academic Progress**

### **GPA Requirements**

Students must have a minimum overall cumulative grade point average of 3.0 to be eligible for the degree. In addition, the grades in courses specifically required for the degree program must average at least 3.0. All graduate-numbered courses taken

with graduate student classification at the University of Delaware are applied to the cumulative index. Credit hours and courses for which the grade is below "C-" do not count toward the degree even though the grade is applied to the index.

### **Academic Probation**

The Office of Graduate Studies monitors the academic progress of all graduate students and notifies students in writing of all academic deficiencies. The cumulative GPA after each 9-hour increment determines academic standing. In addition to the University policy regarding minimum grade point averages, some departments require graduate students to maintain certain performance minima in their programs of study in all or in particular courses. Failure to meet the stated minima may lead to academic dismissal from the program.

### **Satisfactory Progress toward a Graduate Degree**

If a graduate student fails to make satisfactory progress toward all degree requirements, permission may be denied to continue in the degree program. At the close of each semester, winter session or summer session, in those circumstances deemed appropriate by the department or program faculty exercising its professional judgment, the faculty of each department or program may evaluate the progress of a graduate student toward meeting the academic standards of the program in which the student is enrolled. In addition to graded course work, academic standards include, but are not limited to, professional, ethical, clinical and other standards required of graduate students. In the case of dismissal, the program director is required to send a report to the Office of Graduate and Professional Education that states the faculty vote on the decision causing dismissal and the justification for this action. The Office of Graduate and Professional Education will notify a student in writing when the student is being dismissed for failure to make satisfactory progress in the program and the procedures for the student to appeal the action.

### **Time Limits for the Degrees**

Time limits for the completion of degree requirements begin with the date of matriculation and are specifically expressed in the student's letter of admission. The University time limit is ten consecutive semesters to complete the degree requirements for students entering a master's degree program. Students completing the requirements for the master's degree who are subsequently granted permission to continue toward the doctoral degree are given an additional ten consecutive semesters. Students entering a doctoral program with a master's degree are given ten consecutive semesters to complete the requirements. Students entering a doctoral program without a master's degree are given fourteen consecutive semesters to complete the requirements. Students who change their degree plan and have transferred from one degree program to another degree program are given ten consecutive semesters from the beginning of the first year in the latest program.



**Extension of the Time Limit**

Requests for time extensions must be made in writing and approved by the student's advisory committee and the chair of the department's graduate committee. The department will forward the request to the Office of Graduate and Professional Education. The Office will determine the student's eligibility for a time extension and will notify the student in writing of its decision to grant an extension of time.

**Thesis guidelines:**

The University of Delaware regards your thesis as a professional document which conforms to the standards of scholarly writing and follows the guidelines set forth in this manual. Master's theses must reflect both the ability to conduct scholarly research and to report the results in a literate manner worthy of publication. Scholarly writing expectations include organization of ideas and materials, citation style, correct usage, sentence structure, spelling, and punctuation.

The first rule of academic writing is intellectual honesty. Students at the university are expected to be honest and forthright in their academic endeavors. Proper attribution of the work of others is expected. To falsify the results of one's research or other findings with the intent to deceive (fabrication), or to steal the words or ideas of another as if they are one's own work (plagiarism) violates this rule. If you are uncertain about what constitutes fabrication or plagiarism, it is your responsibility to consult your advisor.

Your advisor and advisory committee members also bear responsibility for ensuring that your research topic and the findings make a significant, original contribution to the field and that your presentation meets the criteria for scholarly writing. Your advisor's and committee members' signatures on the approval pages of your paper attest to their having read the final version and to your having met these standards. The signature of the chairperson of your department, the chair of an interdisciplinary committee, and the instructional college dean also attest to your having met these standards.

**Part IV. Assessment Plan**

<b>Assessment plan for M.S. in Statistics</b>				
<b>Objectives</b>	<b>Strategic Activities</b>	<b>Measures</b>	<b>Short-term Outcomes</b>	<b>Long-term Impact</b>
<b>1. Train students in theoretical statistics</b>	recruit excellent applicants and matriculate students with credentials similar to those in the existing departmental graduate programs	Number and demographic data of student applicants and matriculated students.	Retention and time to degree statistics	Students gain employment in statistical related fields
	Course work covering the disciplines of probability, mathematical statistics, and vector spaces and optimization	Faculty evaluation of student progress in course work  Surveys of graduate students in the program and post-graduation	Students are prepared for subsequent coursework that requires the theoretical knowledge	Graduates enjoy long term success in statistical careers; graduates who go on for a Ph.D. in Statistics and related fields
<b>2. Provide training in applied statistical techniques</b>	course work in regression, design of experiments, multivariate analysis, advanced regression, logistic regression, data management, and other approved courses	Surveys of students focusing on their experiences in these classes  Surveys of graduates to determine the utility of these classes to their career  Faculty evaluation of student progress in course work	Course work for the M.S. Statistics degree helped students secure statistics related internships and initial employment  Students and graduates report applying knowledge from courses to work settings	Graduates enjoy long term success in statistical careers
<b>3. Provide experiential training in statistical internships to prepare students for the expectations of the workplace</b>	Internships in statistics  Participation in StatLab	Surveys of students focusing on their experiences in their internship  Surveys of graduates to determine the utility of their internship experience to their career  Faculty and internship mentor evaluation of both the internship work and the written products  Interviews and surveys of internship mentors	Internship prepares students for the workplace and helps them secure their first post-graduation position	Graduates enjoy long term success in statistical careers

## **Part V. Financial aid**

### **A. Financial Awards**

#### **Teaching Assistants (TA)**

Teaching assistantships are awarded to students to assist with specific courses, particularly STAT 200. Teaching assistants are required to lead discussion groups, grade assignments and exams, and other instructional activities. As with any professional appointment, the amount of service may vary from week to week but the average is usually expected to be 20 hours per week.

#### **Research Assistants (RA)**

Research assistantships are generally funded by research grants and contracts provided by external funding agencies. Research assistantships require twenty hours of service or research a week. The amount of service or research may vary from week to week but the average is usually expected to be 20 hours per week. Research assistants are expected to work on their assigned research projects during winter session and may be required to work during summer as well. The amount of each student's stipend will be calculated in accordance with the number of months that the student is employed.

#### **Graduate Assistants (GA)**

Graduate assistantships are awarded to students in exchange for work. Graduate assistants are employed for twenty hours a week in a variety of capacities as administrative assistants to University faculty and administrators or as research or teaching assistance to a faculty member beyond what is required for a Research Assistant. These tasks may or may not be related to the student's program. The amount of service may vary from week to week but the average is usually expected to be 20 hours per week.

#### **Tuition Scholars**

Tuition scholarships provide full tuition but do not pay a stipend. They are awarded according to the same rules that govern eligibility for University fellowships. There is no work requirement for the tuition scholarship. Tuition scholars can meet the requirement to maintain full-time status by enrolling in a minimum of six graduate credit hours per semester. Tuition scholars may accept remuneration for employment inside or outside of the University. Tuition scholars are covered by the University's graduate student Accident and Sickness Insurance Plan.

## Part VI. Departmental Operations

- A. General student responsibilities  
Up-to-date addresses, etc.  
Department of Food and Resource Economics  
213 Townsend Hall  
Newark, DE 19716  
Phone: 302-831-2511  
Fax: 302-831-6243

Laboratories and research equipment. None

Hazardous Chemical Information Act.

Vehicles. No department vehicles are provided.

Keys, offices, mail, telephone, copy machine, computer terminals, etc.  
All graduate students in the Agricultural and Resource Economics Program are given keys to the graduate office; are allowed use of the graduate office computers; are allowed access to the department photocopy machine (a limited monthly copy allotment is granted all graduate students); are allowed access to the department fax machine; and can access department supplies for such things as paper, pens, notepads and staples.

### Access to Student Records

Students wishing to review their Departmental file must submit a written request to the Graduate Program Director at least 24 hours in advance. Students must review the file in the presence of departmental staff or faculty and are not permitted to remove a file from Wolf Hall but may photocopy documents from their folder. All access to student records is in accordance with the Family Educational Rights and Privacy Act.

### Standards of Student Conduct

- A) Academic honesty  
All graduate students are subject to University of Delaware regulations regarding [academic honesty](#).
- B) Laboratory Safety and Research Regulations  
Graduate students performing laboratory research are subject to all University regulations regarding safety, use of human subjects and animals, and hazardous/radioactive material use and disposal. These guidelines may be found in the University of Delaware Policies and Procedures Manual. Students participating in off campus internship experiences are expected to fully comply with all safety regulations of the workplace.

C) Contact information

It is the responsibility of all students to ensure that their contact information on file with the university is current (mailing address, phone number, email address). It is also the student's responsibility to regularly monitor their email, phone and mail for important notices regarding their enrollment.

D). Departmental facilities

Occasionally student's graduate assistantship or other assignments may require the use of departmental laboratories or other facilities. Keys to laboratories, etc., are maintained in the Department office and will be issued based on faculty and Department Chair approval.

Any assignments that require the expenditure of departmental funds (e.g. data collection activities) require departmental approval in advance and are processed through the department in which the work is to be done.