Graduate Program Handbook
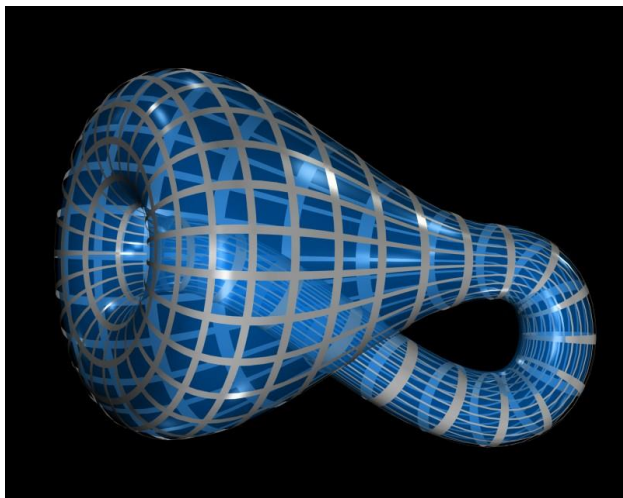
Department of Mathematics and Statistics

College of Sciences

Old Dominion University

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1. INTRODUCTION

1.1 Welcome

Welcome to the graduate program of the Department of Mathematics and Statistics in the College of Sciences. As a graduate student here, you are a vital part of our department and college, and we feel it is important that you thoroughly understand your role. There are many sources of information designed to guide you through your program. Primary among them are your Graduate Program Director (GPD) and Faculty Advisor. This guide and the University Graduate Catalog are sources with which you should become very familiar. This guide is meant to supplement the University Graduate Catalog, never to supersede it. The Catalog should be considered the authoritative source of written university policy.

The University Graduate Catalog:

http://catalog.odu.edu/pdf/2014-15-graduate.pdf

The Code of Student Conduct:

https://www.odu.edu/content/dam/odu/offices/bov/policies/1500/BOV1530.pdf

1.2 Getting Started

When you first arrive on campus, please see the Department Business Manager in the main office of the Department of Mathematics and Statistics on the second floor of the Engineering and Computational Sciences Building (ECS). (International students should first check in at VISA – see below.) The Business Manager will assist you with obtaining your MIDAS Account and Proximity Card. The "Prox" card is needed for using the copier, and accessing certain campus spaces, such as classrooms where you may teach. Graduate Teaching Assistants (GTAs) will also receive their cubicle assignments and a faculty email account. If you are receiving a teaching or research assistantship, please bring your Social Security Card and a picture ID for payroll-related processing. Please note that you will not receive your first paycheck for a few weeks. You should expect to attend orientation meetings held by the University and by the Department. In addition, there is training for new GTAs.

For Newly Admitted Graduate Students:

http://www.odu.edu/content/odu/admission/admitted/graduate.html

International students must first check in with Visa and Immigration Service Advising (VISA, formerly ISSS) located in Dragas Hall, room 2006. Please visit their website for more details about this process: http://www.odu.edu/visa. When you check-in with VISA, you will be directed to a local branch of the Social Security Administration to apply for a Social Security

Card if you do not already have one. The Social Security application must be completed before you will be eligible for employment. The VISA office requests that you have lived in the United States at least 10 days prior to completing your employment paperwork. After these requirements are met, you will be given a small yellow form certifying employment eligibility (this paperwork is known as an I-9). Please bring this form to the Department Business Manager when you receive it. International students might not receive their first paycheck until October, so you should be prepared to support yourself during your initial eight weeks at ODU. You must also attend a mandatory information session for international students before you may register for classes.

For New International Students:

http://www.odu.edu/admission/admitted/international

https://www.odu.edu/esl/new-incoming-student-information

http://www.odu.edu/visa

1.3 ID Cards

Before the semester begins, you need to get a University ID Card. ID Cards are made at the University Card Center, located in Webb Student Center. Their website is:

http://www.odu.edu/af/cardcenter/

Your ID card serves multiple functions. It is a form of identification; it serves as a stored-value debit card on and around campus; and it carries your meal plan. It may also serve as a Proximity Card, which enables access to various academic buildings, classrooms and labs. Please see the Department Business Manager in order to obtain Proximity Card privileges.

1.4 Parking Permits

A University Parking Permit is required in order to park anywhere on campus, except at metered spaces. To purchase a parking permit, go to the Office of Parking and Transportation Services, located off of 43rd street. You have the option of getting a pass for one, two, or three semesters (including summer).   You can also obtain a bus pass from this office for each semester. The Office of Parking and Transportation Services website is:

http://www.odu.edu/af/parking/

1.5 Academic Advising

In order to be able to register for classes, you must obtain academic advising before the start of each semester. For students selecting the Applied Mathematics option, the advisor is the Graduate Program Director. Students in the Statistics or Biostatistics options see the Statistics Program Director for academic advising.

1.6 Registration

Regular registration for classes is done online via LeoOnline. To register, you will select to Enter LEO Online News and Secure Area. The next page will have a lot of information that you can read through if you desire. At the bottom of the page, hit enter secure area. You will then be prompted to enter your User ID, which is your university ID located on your ID Card. From here you can add/drop classes until the deadline. After the deadline, the add/drop process is done on paper, and requires signatures.

LeoOnline

https://www.leoonline.odu.edu/

Add/Drop/Withdraw Form

https://www.odu.edu/content/dam/odu/offices/university-registrar1/docs/add-drop-withdraw-form.pdf

1.7 Information Technology

Students are assigned a MIDAS account, which includes a student email address, access to Leo and Blackboard, and other online services. All students in the graduate program will be included in a departmental distribution list, which is used for important announcements and other mass mailings. Graduate Teaching Assistants and Research Assistants also get an additional instructor email account, and a workstation in their cubicle at ECS. Requests for assistance with Information Technology Services should be directed to the ITS Help Desk at

itshelp@odu.edu

1.8 Health Insurance

The University offers a health insurance plan for all degree-seeking graduate students, which is rated "Gold" under the Affordable Care Act. This program is optional for domestic students, and mandatory for international students. At present, the University is offering a partial subsidy for domestic graduate assistants being paid $5,000 or more per semester. For more information, see

www.uhcsr.com/odu

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1.9 Math/Stat Club and Student SIAM Chapter

The Department runs a Math/Stat Club that serves the interests of its graduate and undergraduate students. It also has a Student Chapter of the Society for Industrial and Applied Mathematics (SIAM). The Club meets regularly and helps bring in colloquium speakers. It also organizes social events, such as the fall and spring picnics. The SIAM Chapter hosts a Math Awareness Conference each spring. Participation in these student organizations is expected of all graduate assistants. Both organizations are recognized by the Office of Student Activities and Leadership, and thus qualify for consideration for student funds.

1.10 AMS Graduate Membership

The Department is an institutional member of the American Mathematical Society (AMS). One of the benefits is that graduate students are eligible for *free* AMS membership as long as they are enrolled. Members are entitled to a journal subscription, discounts on meetings and publications, and opportunities to network with other professionals. Students interested in AMS membership should contact the GPD.

1.11 Degree Programs Offered

The following degrees are offered in the Department of Mathematics and Statistics:

Master of Science (M.S.) in Computational and Applied Mathematics

Doctor of Philosophy (Ph.D.) in Computational and Applied Mathematics

Each student selects one of the following options: Applied Mathematics, Statistics or Biostatistics.

In addition, the Department offers a Graduate Certificate in Modeling and Simulation.

1.12 Writing Proficiency Policy

All students in the graduate program are expected to demonstrate an acceptable level of writing ability. Students needing help to remedy their writing deficiencies will be referred to the Writing Center for diagnosis and assistance. All M.S. candidates will enroll in MATH 632 or in STAT 632 for a master's project.

1.13 Responsible Conduct of Research (RCR) Training

RCR training is required for all graduate students in the University, **who enrolled in and after Fall 2010**. This training is concerned with academic misconduct, responsible authorship, conflicts of interest, and similar matters. Students must complete the RCR training **prior to completion of 12 semester hours** in their graduate program. Those students who started their graduate program prior to Fall 2010 are not subject to this requirement; however, it is strongly recommended that they participate in this training. The process should take less than an hour. When it is completed, an electronic certificate is sent to the University Registrar, and a notation is made in the student's transcript. In addition, students should keep a paper copy of the certificate with their records.

The RCR website:

http://www.citiprogram.org

1.14 Resources

Campus Police
http://ww2.odu.edu/af/police/

Counseling Services
https://www.odu.edu/counselingservices

Monarch Dining and Catering Services
http://www.odu.edu/content/odu/life/dining.html

Graduate Student Organization
http://orgs.odu.edu/gso/

Information Technology Services
https://www.odu.edu/its

Library Services
http://www.odu.edu/library/services

MathSciNet Database
http://www.ams.org/mathscinet/

SafeRide and Campus Escort Service
http://ww2.odu.edu/af/police/faqs/escorts.shtml

Women's Center
https://www.odu.edu/life/support/womenscenter

2. STUDENT STATUS

2.1 Admission Status

While a graduate student in the Department of Mathematics and Statistics, you will be placed in one of three categories:

1. Regularly admitted graduate student

2. Provisionally admitted graduate student

3. Non-degree seeking graduate student

2.2 Regular Admission

Before you obtain a degree, you must be in category 1. To be placed in category 1, you must have applied to your degree program, met all admission requirements and received a letter stating that you have been accepted into the degree program as a regular student.

2.3 Provisional Admission

After applying for admission to your program, you may receive a letter, which states that you have been accepted as a provisional student in your degree program. This places you in category 2. The letter you receive describing the conditions of your acceptance into the program should describe the level of performance you must achieve, or identify the required prerequisite courses. On your initiative, when you believe you have met the conditions stated in the letter you should meet with your Advisor or the GPD to determine if you are ready to apply for a change of status to category 1. If the GPD believes that you have met the required conditions, he or she will initiate the request to have you moved to category 1 by submitting the Notice of Change of Status (Graduate Form G2). Without being admitted to category 1, you cannot be certified for graduation.

https://www.odu.edu/content/dam/odu/offices/graduate-studies/docs/forms/general/g2-notice-of-change-of-status.pdf

2.4 Non-degree Status

If you are taking graduate courses in the College but have not been accepted into a degree program, you are in category 3. If you intend to apply for a degree program at some time, you must remember that you can apply toward your degree *no more* than 12 credit hours of approved courses taken in a non-degree status.

3. M.S. PROGRAM

3.1 Curriculum Requirement

The M.S. candidate must complete a minimum of 31 normal credit hours of course work designed to fulfill an option in applied mathematics, statistics or biostatistics. With approval of the GPD, up to six of these credits may be chosen from a field of application (e.g., geology, oceanography, ecosystem analysis, computer science, economics, health sciences, operations research, physics and engineering mechanics) in which the student applies analytical and numerical techniques to another discipline. All programs of study must be approved by the GPD, and substitutions may be made only with his or her approval.

3.2 Transfer Credits

A maximum of 12 semester hours of graduate credit may be transferred into a graduate degree program from another accredited institution, except in the case of an approved inter-institutional program. Transfer credit will be given only for those courses that are certified as being applicable toward a comparable degree or certificate at the institution that offered the courses, and that were completed with a grade of B or better. In addition, up to 12 credits (with B- or better grade) from non-degree status at ODU may be applied upon the approval of GPD.

A student may earn a maximum of six semester hours through experiential learning mechanisms. The credits earned through experiential learning mechanisms are included in the maximum number of transfer credits allowed at ODU.

A student who wishes to transfer credit earned prior to admission to a degree program at ODU must submit a special request for evaluation of transfer credits through the GPD to the Office of Admissions (use Graduate Form G1).

Graduate Form G1:

https://www.odu.edu/content/dam/odu/offices/graduate-studies/docs/forms/general/g1-evaluation-transfer-credits.pdf

Following admission to the degree program, the student should obtain written permission from the GPD before registering for a course at another institution with the intent of transferring the credit for that course into a graduate degree program at ODU. In no case is a transfer of credit final without the signature of the GPD and the Dean on the Evaluation of Transfer Credits form (Graduate Form G1). See the details of transfer credits in the ODU Graduate Catalog.

3.3 Course Load

The minimum load for a full-time graduate student is 9 graduate credit hours per semester. No more than 12 hours per semester may be carried without the permission of the GPD. In summer

sessions 6 credit hours constitute a full load. Graduate students with a teaching or research assistantship must register for at least 9 hours (or 3 hours during summer).

3.4 Time Limit

All requirements for a M.S. must be completed within six calendar years from the date of initial course enrollment following admission to the program. If any of your credits granted toward your degree will be older than the time limit at the time of graduation, those old credits must be validated by an examination (Graduate Form G3). See "Policy on Validation of Out-of-Date-Graduate Credit" in the ODU Graduate Catalog.

3.5 Master's Project

The M.S. candidate will be assigned to a faculty advisor for a master's project. Each student will enroll in [MATH 632](#) or [STAT 632](#) to complete his/her project. The master's project is designed to broaden the student's analytical competency, and to enhance the student's writing and reporting skills on a technical subject. There is no thesis requirement or option, and there is no comprehensive examination required for the M.S. degree.

3.6 Colloquium Requirement

In order to develop an appreciation for the breadth of contemporary research in applied mathematics and statistics, all M.S. candidates will attend and succinctly summarize and evaluate in writing at least eight professional seminars given by research faculty or external seminar visitors. The Richard F. Barry Colloquium Series is run by the Department throughout the academic year. The Department also conducts seminars jointly with other departments.

The summaries should be submitted (electronically or on paper) to the Graduate Program Director or Statistics Program Director during the semester in which you expect to graduate. A summary is typically a page or two in length, typed, double-spaced. Its content should reflect that you attended the presentation, and understood its main points. Seminars presented by graduate students, as well as seminars in other fields, may be used to fulfill this requirement, provided that there is substantial research content in mathematics or statistics. The summaries must be in your own words, but you certainly may collaborate with anyone in their preparation. Submitting a summary of a seminar you did not attend would constitute a violation of the Honor Code.

3.7 Course of Study

Prerequisites

Prerequisite courses for the Applied Mathematics option are:

At most three from the following can be applied towards the 31-credit degree requirement:

MATH 501	Partial Differential Equations	3
MATH 508	Applied Numerical Methods I	3
MATH 509	Applied Numerical Methods II	3
MATH 517	Intermediate Real Analysis I	3
MATH 518	Intermediate Real Analysis II	3
MATH 522	Applied Complex Variables	3

Prerequisite courses for the Statistics and Biostatistics options are:

MATH 316	Introductory Linear Algebra	3
STAT 331	Theory of Probability	3
STAT 431/531	Theory of Statistics	3
STAT 532	Sampling Theory [*]	3
STAT 535	Design and Analysis of Experiments [*]	3
STAT 537	Applied Regression Analysis [*]	3

* Only these courses can be applied towards the 31-credit degree requirement.

Required Courses

Applied Mathematics Option

MATH 617	Measure and Integration	3
MATH 618	Applied Functional Analysis	3
MATH 632	Master's Project	3
MATH 637	Tensor Calculus and Differential Geometry	3
MATH 693	Engineering Analysis III	3
MATH 622	Numerical Solutions to Differential Equations	3
or MATH 721	Advanced Applied Numerical Methods I	
And at least 15 additional credit hours of approved graduate course work		15
Total Hours		33

Statistics Option

STAT 505	Introduction to Data Handling	3
STAT 535	Design and Analysis of Experiments	3
STAT 537	Applied Regression Analysis	3
STAT 625	Mathematical Statistics I	3
STAT 626	Mathematical Statistics II	3
STAT 627	Linear Statistical Models	3
or STAT 628	Applied Multivariate Analysis	
STAT 632	Master's Project	3
STAT 640	Survival Analysis	3
At least 6 additional credits of approved graduate course work		6
Total Hours		30

Biostatistics Option

STAT 505	Introduction to Data Handling	3
STAT 535	Design and Analysis of Experiments	3
STAT 537	Applied Regression Analysis	3
STAT 540	Clinical Trials	3
STAT 550	Categorical Data Analysis	3
STAT 625	Mathematical Statistics I	3
STAT 626	Mathematical Statistics II	3
STAT 627	Linear Statistical Models	3
or STAT 628	Applied Multivariate Analysis	
STAT 640	Survival Analysis	3
Total Hours		27

And two 600-level courses from either the College of Health Sciences or the Eastern Virginia Medical School offerings in epidemiology, community health, or history of diseases. Also required is the master's project, STAT 632, involving the use of statistical techniques in medical or health related real-life settings.

3.8 Certificate in Modeling and Simulation

The Department of Mathematics and Statistics at Old Dominion University plays an integral part in the University's campus-wide initiative to promote research in Modeling and Simulation. The Department of Mathematics and Statistics offers a certificate in Modeling and Simulation. In order to obtain a certificate in Modeling and Simulation, a student must complete four graduate courses that include MSIM 601 (Introduction to Modeling and Simulation). MSIM 601 is offered

by the Department of Engineering Management and System Engineering. Students may select three other simulation courses from the following Modeling and Simulation courses.

Modeling and Simulation courses in Applied Mathematics

Required Course		3
MSIM 601	Introduction to Modeling and Simulation	
Select three from the following:		9
MATH 508	Applied Numerical Methods I	
MATH 509	Applied Numerical Methods II	
MATH 622	Numerical Solutions to Differential Equations	
MATH 632	Master's Project	
MATH 721/821	Advanced Applied Numerical Methods I	
MATH 722/822	Advanced Applied Numerical Methods II	
Total Hours		12

Modeling and Simulation courses in Statistics

Required Course		3
MSIM 601	Introduction to Modeling and Simulation	
Select three from the following:		9
STAT 535	Design and Analysis of Experiments	
STAT 537	Applied Regression Analysis	
STAT 560	Statistical Simulation/Programming Using Statistical Software Packages	
STAT 597/697	Topics in Statistics	
STAT 630	Time Series Models	
STAT 632	Master's Project	
STAT 640	Survival Analysis	
Total Hours		12

4. Ph.D. PROGRAM

4.1 Curriculum Requirement

The Ph.D. candidate must complete a minimum of 55 normal credit hours of course work (24 beyond a master's degree) designed to fulfill an option in applied mathematics, statistics or biostatistics. With approval of the GPD, up to six of these credits may be chosen from a field of application (e.g., geology, oceanography, ecosystem analysis, computer science, economics, health sciences, operations research, physics and engineering mechanics) in which the student applies analytical and numerical techniques to another discipline. All programs of study must be approved by the GPD, and substitutions may be made only with his or her approval.

A Ph.D. student receiving a grade of C+ or lower in any graduate course may be dropped from the program.

4.2 Transfer Credits

A maximum of 12 semester hours of graduate credit may be transferred into a graduate degree program from another accredited institution, except in the case of an approved inter-institutional program. Transfer credit will be given only for those courses that are certified as being applicable toward a comparable degree or certificate at the institution that offered the courses, and that were completed with a grade of B or better. In addition, up to 12 credits (with B- or better grade) from non-degree status at ODU may be applied upon the approval of GPD.

A student may earn a maximum of six semester hours through experiential learning mechanisms. The credits earned through experiential learning mechanisms are included in the maximum number of transfer credits allowed at ODU.

A student who wishes to transfer credit earned prior to admission to a degree program at ODU must submit a special request for evaluation of transfer credits through the GPD to the Office of Admissions (use Graduate Form G1).

Graduate Form G1:

https://www.odu.edu/content/dam/odu/offices/graduate-studies/docs/forms/general/g1-evaluation-transfer-credits.pdf

Following admission to the degree program, the student should obtain written permission from the GPD before registering for a course at another institution with the intent of transferring the credit for that course into a graduate degree program at ODU. In no case is a transfer of credit final without the signature of the GPD and the Dean on the Evaluation of Transfer Credits form (Graduate Form G1). See the details of transfer credits in the ODU Graduate Catalog.

4.3 Course Load

The minimum load for a full-time graduate student is 9 graduate credit hours per semester. No more than 12 hours per semester may be carried without the permission of the GPD. In summer sessions 6 credit hours constitute a full load. Graduate students with teaching or research assistantship must register for at least 9 hours (three hours for summer). All doctoral students who have successfully advanced to candidacy and only need to complete their dissertation must register for at least one graduate credit hour each semester (fall, spring, and summer) until the degree is completed.

4.4 Time Limit

All requirements for a Ph.D. must be completed within eight calendar years from the date of initial course enrollment following admission to the doctoral program. If any of your credits granted toward your degree will be older than the time limit at the time of graduation, those old credits must be validated by an examination (Graduate Form G3). See "Policy on Validation of Out-of-Date-Graduate Credit" in the ODU Graduate Catalog.

4.5 Selection of an Advisor

When you enter a Ph.D. degree program, either as a provisional or regular student, you should coordinate with the GPD to select an advisor. This advisor will be selected with consideration given to your area of research interest, faculty workload and preference.

4.6 Colloquium Requirement

In order to develop an appreciation for the breadth of contemporary research in applied mathematics and statistics, all Ph.D. candidates will attend and succinctly summarize and evaluate in writing at least sixteen professional seminars (eight beyond a master's degree) given by research faculty or external seminar visitors.

The summaries should be submitted (electronically or on paper) to the Graduate Program Director or Statistics Program Director no later than the semester in which you expect to graduate. A summary is typically a page or two in length, typed, double-spaced. Its content should reflect that you attended the presentation, and understood its main points. Seminars presented by graduate students, as well as seminars in other fields, may be used to fulfill this requirement, provided that there is substantial research content in mathematics or statistics. The summaries must be in your own words, but you certainly may collaborate with anyone in their

preparation. Submitting a summary of a seminar you did not attend would constitute a violation of the Honor Code.

The Richard F. Barry Colloquium Series is run by the Department throughout the academic year. The Department also conducts seminars jointly with other departments.

4.7 Advisory Committee

Before you have completed nine semester hours of graduate course work you must, in consultation with your advisor, nominate and have appointed your advisory committee. This is accomplished with the Ph.D. Advisory Committee Form (Graduate Form D1). In general, the committee consists of at least three faculty members who are certified for graduate instruction. The approval authority for all advisory committees is the Dean of the College. The nomination of your committee will be forwarded to the Dean through the GPD. The advisory committee will continue to serve until the student has completed the candidacy examination successfully and the dissertation committee has been formed. Changes in committee membership may be requested using Graduate Form D1.

4.8 Course of Study

Applied Mathematics Option

MATH 605	Complex Variables I	3
MATH 617	Measure and Integration	3
MATH 618	Applied Functional Analysis	3
MATH 622	Numerical Solutions to Differential Equations	3
MATH 637	Tensor Calculus and Differential Geometry	3
MATH 638	Mathematical Theories of Continua	3
MATH 693	Engineering Analysis III	3
MATH 801 & MATH 802	Asymptotic and Perturbation Methods and Integral Equations	6
MATH 821 & MATH 822	Advanced Applied Numerical Methods I and Advanced Applied Numerical Methods II	6
MATH 803	Advanced Applied Mathematics I	3
or MATH 825	Computational Fluid Dynamics and Solid Mechanics	
Total Hours		36

Statistics or Biostatistics Option

MATH 517	Intermediate Real Analysis I	3
STAT 547	Analysis of Longitudinal Data	3
STAT 550	Categorical Data Analysis	3
STAT 625	Mathematical Statistics I	3
STAT 626	Mathematical Statistics II	3
STAT 627	Linear Statistical Models	3
STAT 628	Applied Multivariate Analysis	3
STAT 630	Time Series Models	3
STAT 640	Survival Analysis	3
STAT 827	Statistical Inference I	3
STAT 828	Statistical Inference II	3
Total Hours		33

Students who wish to concentrate in Biostatistics must take STAT 540 and at least six credits at the 700-level from either the College of Health Sciences or the Eastern Virginia Medical School offerings in epidemiology, community health, or history of diseases.

4.9 Admission to Candidacy Examination

During the last semester of course work you must arrange through your advisory committee and the GPD to take the Admission to Candidacy Examination (also known as "Qualifiers"). In order to be eligible to take this examination you must achieve a GPA of at least 3.00 on all course work completed. The candidacy examination consists of a written part only, which is typically administered during multiple sessions over two days.

The exam in Applied Mathematics consists of four parts, based on four 600+ level courses selected in consultation with the GPD. At least one of the courses must be MATH 617 or MATH 618. The exam in the Statistics or Biostatistics options consists of two parts, covering theoretical and applied statistics, respectively.

The Examining Committee will determine whether the student has passed or failed the exam, and in the latter case, what portions of the exam must be retaken. You have two opportunities to pass the exam. Any retaken portion must be done within one year. No part of the candidacy examination can be passed conditionally. The successful completion or the failure of each candidacy examination must be reported on Graduate Form D3.

4.10 Dissertation Committee

After passing the Admission to Candidacy Examination, the Dissertation Committee is formed to supervise your dissertation research. The Dissertation Committee is appointed by your dissertation advisor in consultation with the GPD. The makeup of this committee is specified in the ODU Graduate Catalog. In general, it consists of at least three faculty members (one from outside the major department). Its composition will reflect the topic of your dissertation, and the committee chair will be your dissertation advisor. This will be accomplished using Graduate Form D2.

4.11 Dissertation Proposal

Once the Dissertation Committee has been formed, you should present your dissertation proposal to the committee members through the committee chair. The Dissertation Committee will evaluate and approve (or disapprove) your dissertation prospectus.

4.12 Admission to Candidacy

Admission to Candidacy occurs after the student has (1) passed the Advancement to Candidacy Examination, (2) obtained approval for his or her dissertation proposal, and (3) completed the required course work.

4.13 Registration after Becoming a Candidate

After having successfully advanced to candidacy, you are required to be registered for at least one graduate credit hour each semester (fall, spring, and summer) until you complete your degree. Failure to comply with this requirement will result in charges to your account for one graduate credit, plus a required fee for each semester after advancement to the candidacy. To avoid the above charge, you may formally apply for a petition of a leave of absence for a semester (up to one year) to the dissertation committee and the GPD before the beginning of the semester (Graduate Form D7). During the leave of absence, you will not be entitled to assistance from the Dissertation Committee or to the use of University facilities.

4.14 Dissertation Work

You will perform your research and prepare your dissertation under the guidance of your Dissertation Committee. For details see the "Guide for Preparation of Theses and Dissertations," which is available at http://ww2.sci.odu.edu/sci/about/information/thesis/thesis.pdf.

4.15 Oral Dissertation Defense

The format of a defense is determined by the Dissertation Committee with the approval of the GPD. The defense is chaired by the chair of the Dissertation Committee. The chair will act as moderator, ruling on questions of procedure and protocol that may arise during the defense. The chair should promptly notify the GPD of the results of the defense.

The oral dissertation defense is scheduled for the time and place approved in the request for the dissertation defense. A two-week lead time is required for scheduling. This information is published in the appropriate University news media. The oral dissertation defense is open to the University community; all interested members are encouraged to attend the examination.

The aim of the defense is to explore with the candidate the methodological and substantive contributions of the already approved dissertation. Majority approval by the examiners constitutes successful completion of the defense of the dissertation. In case of failure, the Dissertation Committee may recommend that the candidate be dropped from the program, or be allowed re-examination no earlier than three months after the first examination.

Satisfactory performance on this examination and adherence to the regulations outlined above complete the requirements for the degree. The Dissertation Acceptance and Processing Form must be submitted to the Office of the Registrar with the completed dissertation upon completion of requirements for the degree.

4.16 Application for Graduation

A formal application for the expected diploma must be made in the Office of the Registrar five to six months prior to the expected date of graduation

5. FINANCIAL AID

Various types of financial aid are available on a competitive basis for graduate students in Mathematics and Statistics. Financial awards are determined by the graduate program and Dean.

5.1 Graduate Teaching Assistantships

There are two categories of graduate teaching assistantships: GTA Assistants and GTA Instructors. GTA Assistants do not directly instruct students; rather, they assist instructors with grading, laboratory preparation, tutoring or proctoring tests. GTA Instructors teach their own sections of a course, such as MATH 102, MATH 162, or STAT 130. The workload for a full-time GTA is normally twenty hours per week on average, including preparatory work. Graduate

Teaching Assistantships in the Department of Mathematics and Statistics typically offer stipends ranging from $15,000 to $18,000 per academic year. The level of award is determined on the basis of the availability of funds, previous experience, performance as a graduate assistant, and on academic achievement in applied mathematics or statistics. In addition, the stipend is usually accompanied by a full tuition waiver. The performance of GTAs is evaluated each semester by the Department. Satisfactory performance is a condition for renewal of the assistantship.

A number of Graduate Teaching Assistantships are typically available during the summer months (June and July).

In most cases, subject to satisfactory academic performance and the availability of funds, a Graduate Teaching Assistantship is renewed annually up to four years. If a graduate student needs financial support beyond the fourth year, it may come in the form of an adjunct teaching appointment. Adjunct instructors are not eligible for the tuition waiver.

5.2 GTA Instructors

In order to advance from GTA Assistant to GTA Instructor, the student must earn a master's degree, pass the two-day GTAI Institute given by the College and University, and complete one semester of departmental Faculty Mentoring. During this Faculty Mentoring process, the student will be assigned to a faculty mentor, and work with the mentor on all phases of teaching a class, including writing a syllabus, preparing lectures, monitoring student progress, making up tests and quizzes, and conducting the class meetings. It is expected that the student will be delivering some of the class lectures and receiving feedback on his or her performance. The student is not expected to be a grader for the class.

Qualification for GTA Instructor does not guarantee the assignment of a class.

All GTA Instructors will be required to pass the GTAI Institute in order to receive a GTA stipend. The Institute is offered twice a year during the week before fall and spring classes begin. The institute comprises the University portion and the College portion. Students are required to attend both portions to pass the Institute.

Students whose first language is not English must also pass the SPEAK Test. A passing score on the SPEAK test is 50. Students who marginally fail the SPEAK test with a score of at least 45 will be offered the opportunity to participate in a re-test as a part of the GTAI Institute, to determine if face-to-face communication is sufficient for holding a teaching assistantship.

5.3 Graduate Research Assistantships

A Graduate Research Assistantship (GRA) may be funded through a sponsored research project. The appointee is expected to participate directly in research conducted by faculty members. The workload for a full-time assistant is normally twenty hours per week on average.

5.4. Application

Application forms for graduate assistantship stipends paid by the University (GTAs and GRAs) are available from the Office of Admissions or from the University's web page. The completed form, together with a brief essay by the applicant discussing academic interests and career objectives, must be submitted to the GPD or office making the appointment, as soon as possible for fullest consideration. Applications for GRA positions funded through ODURF are made through the faculty member who is the principal investigator, the Department Chair, or Graduate Program Director.

5.5 Enrollment and Registration Requirements

Only students admitted to the Department's graduate degree programs are eligible for appointment to a graduate assistantship. All students appointed to a graduate assistantship are required to verify their identity and employment eligibility and complete an I-9 Form, according to University procedures, prior to commencing their duties. Students must be in good academic standing in order to receive an assistantship. Assistantships will accordingly be terminated for any student whose GPA is less than 3.0.

Graduate Teaching Assistants are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of *nine* hours of graduate course work per semester and *three* hours in the summer.

Graduate Research Assistants are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of *six* hours of graduate course work per semester and *three* hours in the summer.

All doctoral students (regardless of their funding source) who have successfully advanced to candidacy and only need to complete the dissertation must register for at least *one* hour of graduate credit every semester until graduation (see Continuous Enrollment Policy in the Catalog.) Students who have advanced to candidacy and are enrolled for one credit are eligible for full tuition exemption. The graduate form, Doctoral Candidates 1-Hour Full-Time Notification, must be completed and forwarded to Student Employment in the Office of Finance. Master's students holding graduate teaching, research, or administrative assistantships who are in their final semester and who are within six hours of completing their degree requirements may register for six or fewer graduate credit hours needed for the completion of their degree. Such students will be considered full-time. Master's students are eligible for reduced enrollment requirement for no more than one semester.

Students are required to complete all of the credit hours necessary for the degree. Undergraduate prerequisite courses and courses taken for audit are not normally counted toward the enrollment requirement, except upon the recommendation of the GPD, Department Chair, and the Dean.

5.6 Tuition Waivers

Graduate students who are awarded a fellowship or who are employed as graduate assistants may receive partial to full tuition assistance. In compliance with federal guidelines a graduate student must receive a minimum of $3,200 in assistantship or fellowship support for the fall and spring semesters and a minimum of $2,500 during the summer, in order to qualify for the tuition waiver. The tuition waiver may not be applied to undergraduate courses, repeated courses, or courses elected on an audit basis.

A student who completes less than half of the assistantship or fellowship appointment will be required to return his/her full tuition assistance award to the University.

5.7 Outside Employment

Full-time (20 hours per week) graduate assistants are not permitted to accept additional on-campus employment, except under unusual circumstances and only by the approval of the Dean. Any off-campus employment should be undertaken with caution and in consultation with the GPD. It should in no way adversely affect academic performance or assistantship duties and responsibilities. International students should consult the VISA Office for international student employment guidelines.