MATHEMATICS DEPARTMENT
OREGON STATE UNIVERSITY
CORVALLIS OR 97331-4605

Revised by D. Garity, September 2002

INTRODUCTION

This pamphlet describes the graduate programs of the Mathematics Department at Oregon State University and provides students with a road map of the steps necessary to earn a Master's degree or Doctorate. The Mathematics Department is of moderate size with about 24 graduate faculty and 40-50 graduate students. About 40 graduate students are supported by teaching assistantships or research assistantships. The fields of the faculty are diverse but special areas of strength are algebra, analysis, applied mathematics, differential geometry, mathematics education, numerical analysis, probability, and topology. The Master's program also has an option for study in financial math and in actuarial science. Areas of expertise of the faculty can be found at the end of this pamphlet, in the OSU Graduate Catalog, and in more detail on the department's web site at:

http://osu.orst.edu/dept/math/docs/faculty_research.html

General information about Oregon State University and about the Mathematics Department is available via the home pages:

http://osu.orst.edu   http://osu.orst.edu/dept/math

CHECKLIST OF SOME REQUIREMENTS FOR GTAS AND GRAS

Specific requirements for the Master's Degree, the Ph.D. Degree and additional requirements for GTAs and GRAs are listed in this pamphlet. It is the student's responsibility to read this pamphlet and be aware of all requirements. The following is a checklist intended to remind GTAs and GRAs of some of the requirements.

Fall Term:

- File a course plan for the year with the graduate committee. (See the sample form at the end of this pamphlet.)

Each Term:

- Sign up for 15 credits including the correct number of non-blanket numbered courses. (See the section on course loads.)

General Requirements:

- File a degree program in a timely manner. See the specific sections on Master's or Ph.D. degrees for details.

- Sign up for and take the qualifying exam in a timely manner if you are getting a Master's degree under the non-thesis option or a Ph.D. degree. See the specific section on the qualifying examination.

- Take the correct number of core courses and other courses required for your degree. See the See the specific sections on Master's or Ph.D. degrees for details.

- Be aware of Graduate School requirements for the degree that you are working on. Check with the graduate school for details.

THE GRADUATE COMMITTEE

A list of current members of the Graduate Committee is posted in the graduate student/faculty room and is available from the graduate secretary. The Graduate Committee has general oversight responsibility for the academic aspects of the graduate program. In particular, it is responsible for approving or denying petitions for changes to the normal departmental requirements for advanced degrees. The committee advises students throughout the year on any aspects of the graduate program. The Graduate Committee is responsible for advising and approving the study plans, including course work taken each year, of all graduate students in mathematics until they find major professors and file official degree programs with the graduate school. At that time, major professors and degree committees assume primary advising and approval responsibility for their students.

It is recommended that those students interested in a particular area of mathematics meet with the faculty in that area upon entering the graduate program.

Students with questions are encouraged to meet directly with individual members of the Graduate Committee or to contact the full committee via e-mail. The e-mail address gradcomm@math.orst.edu sends e-mail to members of the graduate committee. In particular, petitions to the graduate committee should be sent to this e-mail address. However, before submitting a petition, a student may wish to discuss the situation with a member of the committee. This procedure will expedite action on the petition.

DEPARTMENTAL AND INSTITUTIONAL REQUIREMENTS

Graduate students must satisfy both departmental and institutional (general university) requirements for a particular degree program. This pamphlet describes the departmental requirements. Institutional requirements are given in the Graduate Catalog and the Graduate Student Survival Guide, both available from the Graduate School. Specific information may be obtained by calling the Graduate School at (541) 737-4881. Some of the institutional requirements are mentioned in this pamphlet. **However, students are responsible for obtaining complete and up-to-date information on the current institutional requirements from the Graduate School.**

In what follows some course requirements distinguish between "blanket" and "non-blanket" numbered courses. See "A Synopsis of Institutional Requirements" later in this pamphlet for the meaning of these terms.

CORE GRADUATE COURSES

The mathematics department faculty have designated 15 courses as core graduate courses. **Core courses typically have midterm and final examinations and problem assignments.** All of these courses are intended to be accessible to a first year graduate student with a standard undergraduate mathematics degree. The table below lists the core courses and the terms when they are typically offered.

CORE GRADUATE COURSES		
FALL	**WINTER**	**SPRING**
Analysis 1 (Mth 511)	**Analysis 2 (Mth 512)**	**Complex Analysis (Mth 611)**
Linear Algebra (Mth 543)	Algebra 1 (Mth 644)	Algebra 2 (Mth 645)
Applied Mathematics 1 (Mth 621)	Applied Mathematics 2 (Mth 622)	
Numerical Analysis 1 (Mth 551)	Numerical Analysis 2 (Mth 552)	
Topology 1 (Mth 631)	Topology 2 (Mth 632)	Geometry (Mth 674)
	Probability 1 (Mth 664)	Probability 2 (Mth 665)

Note: Numerical Analysis III (Mth 553) may be substituted for Numerical Analysis I in requirements listed below.

All graduate students must take the 4 courses listed in boldface above, (Mth 511, 512, 611, and 543). Master's students must take at least 4 additional courses from the core, including at least one additional two-term sequence. Ph.D. students must take at least 8 additional courses from the core, including at least 3 additional two-term sequences. More details on the requirements for the various degrees are given in the sections below.

REQUIREMENTS FOR THE MASTER'S DEGREE

Oregon State University offers both an MA and an MS degree in Mathematics. The essential difference between the two is that the MA has the additional requirement of second-year proficiency in a foreign language, as determined by the Graduate School. A student must complete the following steps in order to earn a Master's degree. (Check with the Graduate School directly to verify the institutional requirements and time frames for some of the steps outlined below.)

A. *Acceptance into the Master's Program.*

A notice of admission to the Master's Program in Mathematics comes from the University Office of Admissions. A student remains in the program as long as satisfactory progress is made toward the degree, with completion expected in two years. Occasionally, additional time may be granted upon petition to the Graduate Committee, particularly in those cases where additional undergraduate background is required.

B. *Selection of a Major Professor and Degree Committee.*

By the end of Spring term of the first year in residence, a student must choose a major professor from the graduate mathematics faculty. This is done by mutual agreement. The Degree Committee consists of the major professor, minor professor, and another member of the mathematics faculty. For the thesis option, a fourth (non-mathematics) faculty member is chosen from a list provided by the Graduate School.

C. *Master's Degree Program.*

A student and major professor develop an official degree program, subject to the institutional and departmental requirements in D below. The degree program should include one of the following:

```
(i)   a Master's Thesis,
(ii)  a Master's Expository Paper,
(iii) the non-thesis option.
```

A student who chooses the non-thesis option is required to earn the grade of "pass" on the Ph.D. qualifying examination and is required to take three additional core courses. The student records the chosen program on a Master's Program Form obtained from the Graduate School. The program must be approved and signed by both the major and minor professors, **initialed by the Graduate Committee Chair**, and finally approved and signed by the Department Chair. The Graduate School requires that a Master's program be filed before completing 18 hours of graduate credit. A student who does not file a program by the specified deadline will not be allowed to register for the following term.

D. *Institutional and Departmental Course Requirements.*

The Graduate School requires that a Master's degree program include at least 45 credit hours of course work of which approximately 15 hours is in a minor, which may be in mathematics. If an outside minor is chosen, a representative from the minor field must approve that portion of the Master's program.

The Department requires that each student complete four required core courses,

Real Analysis I (Mth511)	Real Analysis II (Mth 512)
Linear Algebra (Mth 543),	Complex Analysis I (Mth 611).

Four additional core courses from the following list must also be completed. The four additional courses must be chosen to include a two-term sequence from one of the five groups:

Abstract Algebra (Mth 644, 645)	Applied Math (Mth 621, 622)
Numerical Analysis (Mth 551, 552)	Probability (Mth 664, 665)
Topology, Geometry(Mth 631, 632, 674)	

All of these courses are intended to be accessible to a first year graduate student with a standard undergraduate mathematics degree. All eight courses must appear on the Master's Degree Program (hence, none may be taken S/U). Numerical Analysis III (Mth 553) may be substituted for Numerical Analysis I in satisfying the core course requirement.

A Master's degree program with the thesis option requires 6-12 hours of Mth 503 (Thesis). The Master's paper option requires 3-6 hours of MTH 501 (Research). The non-thesis option requires passage of the qualifying exam, as explained in the next section. None of the courses Mth 581-582-583 can be used in a graduate program in mathematics. Each Master's candidate must complete at least 42 credits of non-blanket numbered, graduate-level course work, which may include non-MTH courses that are essential for the degree program. These courses must be approved by the student's degree committee and by the Chair of the Graduate Committee. Occasionally a student has inadequate background to successfully begin and complete Mth 511 and/or Mth 543 during their first term in our program. Such a student should meet with the Chair of the Graduate Committee no later than the end of the first week of Fall Term to discuss the situation and to devise a plan of study to propose to the Graduate Committee.

E. *Thesis, Paper, or Examination.*

Each Master's candidate must either write a Master's thesis, a Master's paper, or pass the Ph.D. qualifying examinations as described below.

If a student chooses to write a Master's thesis, a copy is provided to the Graduate School and a Graduate Council Representative is chosen to represent the Graduate School on the Degree Committee. The thesis must be printed and bound according to Graduate School requirements.

If a student chooses to write an expository paper, there is no need for a Graduate Council Representative. The Graduate School requirements concerning the format of a thesis need not be followed. However, a Master's paper must be prepared with a word processor capable of producing standard mathematical symbols and equations and be printed on high quality paper. In either case, the Department of Mathematics and each member of the Degree Committee must receive a copy of the thesis or paper at least one week in advance of the defense date.

In lieu of writing a thesis or paper, a student must take three additional core courses beyond the requirements in subsection D and also earn a grade of "pass" on the Ph.D. qualifying examination. Information concerning these examinations is contained in the Ph.D. section of this pamphlet. A Master's student who is considering applying to the Ph.D. program should take the departmental qualifying exam by the beginning of the second year in the Master's program.

F. *Final Oral Examination.*

Each Master's candidate must pass an Oral Examination based on the courses in the student's Master's program; if the student has chosen the paper or thesis option, the Oral Examination will be also based on this work. It is the student's responsibility to find a time agreeable to the Degree Committee for the Oral Examination, and to reserve a room for that time with the department receptionist. The student then requests that the Graduate School officially schedule the Oral Examination. It is the student's responsibility to ensure that all committee members know the date, time, and location of the Oral Examination.

HOW A MASTER'S STUDENT ENTERS THE Ph.D. PROGRAM

The change from the Master's program to the Ph.D. program normally occurs when the Master's degree has been completed or when completion is imminent. The following steps are required for admission to the Ph.D. program:

1) Complete and submit the appropriate change of program form available from the Graduate School or departmental graduate secretary.
2) Submit the following information to the Graduate Committee:
   a) Two letters from departmental faculty supporting the student's application for admission to the Ph.D. program.
   b) A brief letter of intent that outlines the student's plans, goals, and reasons for wishing to enter the Ph.D. program.

The Graduate Committee evaluates applications for admission to the Ph.D. program using the foregoing information and the student's overall academic record. Normally, the Graduate Committee expects that an applicant to the Ph.D. program will have at least a 3.5 GPA in graduate mathematics courses, will have completed all required MS core courses, and will have taken the Ph.D. qualifying examination with the grade of pass. (The Ph.D. qualifying examinations are discussed later.)

REQUIREMENTS FOR THE Ph.D. DEGREE

The Ph.D. represents specialized study and independent research beyond the level of the Master's Degree. The goal of the Ph.D. program is to enable a student to become a mathematician with the ability to continue with an independent research program. An additional goal is to obtain employment in a field where the student's mathematical training can be used in a productive and satisfying way to the benefit of the student and society. Doctoral theses in our department are often written in the areas of algebra, analysis, applied mathematics, differential geometry, mathematics education, numerical analysis, probability, and topology. The following steps are required in the pursuit of the Ph.D. Some of the steps involve deadlines and time restrictions imposed by the Graduate School. These are described in the Graduate School Bulletin, the Graduate Student Survival Guide and in periodic announcements by the Graduate School.

A. *Acceptance into the Ph.D. Program*

The notice of admission to the University Ph.D. program in mathematics will either come from the University Office of Admissions or from the Mathematics Department. A student remains in the program as long as satisfactory progress is made toward the degree. If a student applies to the Ph.D. program and does not already have a Master's degree when admitted, the student will automatically be placed in the Master's degree program. Since one way to get a Master's degree is a non-thesis option that includes passing the Ph.D. qualifying examination, initial admission to the Master's program causes no unnecessary delay for students continuing on for a Ph.D.

B. *Departmental Course Requirements*

The Department requires that each student complete four required core courses,

Real Analysis I (Mth511)	Real Analysis II (Mth 512)
Linear Algebra (Mth 543),	Complex Analysis I (Mth 611).

Eight additional core courses from the following list must also be completed. The eight additional courses must be chosen to include three two-term sequences from the five groups:

Abstract Algebra (Mth 644, 645)	Applied Math (Mth 621, 622)
Numerical Analysis (Mth 551, 552)	Probability (Mth 664, 665)
Topology, Geometry(Mth 631, 632, 674)	

All twelve courses must appear on the Ph.D. Degree Program (hence, none may be taken S/U). Numerical Analysis III (Mth 553) may be substituted for Numerical Analysis I in satisfying the core course requirement.

Students are encouraged to take as many of these courses as possible and will need to take a variety of other courses as specified in their official Ph.D. program. Students are encouraged to formulate the strongest and broadest possible program. None of the courses Mth 581-582-583 can be used on a graduate program in mathematics.

C. *Qualifying Examination*

The Qualifying Examination is a written examination. The coverage of the qualifying exam is roughly the material typically covered in the core courses, Real Analysis I, Real Analysis II, Complex Analysis I, and Linear Algebra. Syllabi for the qualifying examination and copies of previous examinations are available in the Graduate Student and Faculty Room, K302. The qualifying exam will be given once each year, normally during the week before classes begin in the fall quarter. The qualifying exam is a single examination but it is administered in two parts. Part one covers Real Analysis I and II. Part two covers Complex Analysis and Linear Algebra. One part of the exam will be given one day and the other part is given one or two days later. A single grade will be given for the entire examination. In order to maintain reasonable consistency of the examination, the qualifying examination will be made up and administered by a four-person faculty committee with staggered two-year terms.

A student may take the Ph.D. qualifying examination a maximum of two times after his or her first academic year in residence. The possible grades for the qualifying examination will be pass or fail

D. *Selection of a Major Professor.*

A Major Professor must be selected from the Graduate Faculty. Selection, which is a matter of mutual agreement, occurs sometime between arrival at OSU and soon after completing the qualifying examinations.

E. *Formation of a Degree Committee.*

After a Major Professor is selected and the general direction of graduate studies is agreed upon, the student and the Major Professor arrange for the formation of a Degree Committee. This Committee consists of the Major Professor, at least two other members of the Mathematics Graduate Faculty, a Professor from the minor department (which may be Mathematics) and a Graduate Council Representative. A list of potential Graduate Council Representatives is available from the Graduate School. The student is responsible for finding a faculty member on the list that is willing to serve on the degree committee. The student's major professor may have suggestions for possible Graduate Council Representatives.

F. *Program Meeting.*

The student and Major Professor formulate a proposed Ph.D. program. The student describes the program on a Ph.D. Program Form obtained from the Graduate School, returns the completed forms to the Graduate School, and schedules a meeting of the Degree Committee. It is the responsibility of the student to find a time agreeable to the committee members and to ask department graduate secretary to reserve a room. It is the student's responsibility to make sure that all committee members know the date, time, and location of the meeting.

At the meeting, which the student attends, the official Ph.D. program is formulated and approved. It may be changed subsequently by mutual agreement of the student and the Degree Committee. Appropriate forms must be filed with the Graduate School.

The Graduate School regulations state that a student who holds a Master's degree and is admitted to the doctoral program must file a Ph.D. program by the end of one calendar year of enrollment as a doctoral student. A Ph.D.

student without a Master's degree must file a program by the end of the fifth term of enrollment as a doctoral student. A student who does not file a program within the specified deadline will not be allowed to register for the next term.

The proposed Ph.D. program must be equivalent to at least three years of full-time work beyond the Bachelor's degree. In particular, the program should contain at least 108 term credit hours. It is common for a Ph.D. program to include some hours that were used also for the Master's degree. Thesis hours and transfer credits count toward the total credit hours on the program. About 36 hours of thesis is typical and considered necessary.

The number of transfer credit hours permitted on a program and the grades for foreign transfer courses are determined by the Graduate School. A student wishing to use transfer courses should meet with the Associate Dean of the Graduate School to determine which courses can be transferred prior to scheduling the program meeting and submitting a proposed program to the Graduate School. The cumulative equivalent of one full-time academic year (defined as 36 credits) of non-blanket course work must be included in the doctoral program.

G. *Foreign Languages.*

Reading proficiency in French, German, or Russian is required. In cases where another language is preferable for professional reasons, the student may petition his or her Ph.D. Degree Committee for a substitution. Language proficiency is verified by a Departmental Language Examiner either by means of an examination or on the basis of an Educational Testing Service Foreign Language Test. A departmental language examination is meant to test reading proficiency in mathematics. Typically, but not necessarily, a student is asked to give a written translation of a passage taken from a mathematical paper or a book with the use of a dictionary. The names of current Departmental Language Examiners can be obtained from the graduate secretary.

H. *The Oral Preliminary Examination.*

Requirements A-G, cited above, must be completed before scheduling the Preliminary Examination. The Preliminary Examination is a two-hour oral examination, conducted by the student's Degree Committee. It must be scheduled with the Graduate School at least one week in advance. The Preliminary Examination is taken near the completion of the course work on the student's Ph.D. program. The student's Degree Committee conducts the examination. The Graduate School requires that at least half of the examination be over the course work on the Ph.D. program. The examination also may include an oral presentation by the student on aspects of the proposed thesis topic.

By graduate school regulation, at least one complete academic term must elapse between the Preliminary Oral Examination and the Final Oral Examination. (See J. below.) The student schedules the Preliminary Examination with the Graduate School at a time agreeable to the Degree Committee and at a place arranged by departmental secretary. It is the responsibility of the student to ensure that all committee members know the date, time, and place of the examination. At the end of the examination, the student temporarily leaves the room and the committee members discuss the student's performance and vote to determine whether the student has passed the examination. If members of the committee cast more than one negative

vote, the candidate fails; otherwise, the candidate passes. In the event of a failure, the Graduate School permits no more than two re-examinations.

ɪ. *Thesis.*

The Ph.D. thesis should contain a significant research contribution by the student. It should contain original results, which are publishable in a recognized mathematics journal. Also, it should be a well-written exposition describing the significance of the results and their relevance to related mathematical areas. The Graduate School mandates the format of the thesis. Three signed copies of the thesis must be given to the university - two copies for the Graduate School and one copy for the Department.

ɟ. *Final Oral Examination.*

This is a two-hour oral examination conducted by the student's Degree Committee. It is usually limited to a presentation and defense of the thesis. The university community is invited to the presentation and has an opportunity to ask questions. The defense portion is open only to members of the university faculty. The student schedules the final examination with the Graduate School at a time agreeable to the Degree Committee and at a place arranged by departmental receptionist. The examining committee consists of the student's Degree Committee and any additional members, including professors from other institutions, whom the major department may appoint.

ᴋ. *Graduate Council Representative (G.C.R.)*

A graduate faculty member chosen from an area outside the student's department represents the Graduate Council on a Ph.D. student's committee. The G.C.R. is responsible for ensuring that the examinations are conducted in accordance with Graduate School guidelines. The G.C.R. is a full voting member of the committee and must participate in the program meeting, the preliminary oral examination, and the final oral examination. The G.C.R. handles procedural problems during the examinations and chairs that portion of the examinations concerned with evaluation of the student's performance. The student's major professor chairs other portions of the examination.

GRADUATE TEACHING ASSISTANTS AND RESEARCH ASSISTANTS

A Graduate Teaching Assistantship is a working scholarship. The teaching duties of an assistantship are very important. Competent performance of these duties is necessary for reappointment. However, just as with the initial GTA appointment, reappointment depends largely on academic performance. Maintaining a strong academic record and making timely progress toward completion of the requirements for graduate degrees are paramount in considerations for reappointment. This includes timely completion of the Master's degree, Ph.D. Qualifying Examination, and the Oral Preliminary Examination. Likewise, a Graduate Research Assistantship is a working scholarship.

GRA appointments are made by the faculty member supporting the research with the concurrence of the Department Chair and Graduate Committee. Often, as funds become available, a faculty member offers a GRA to a current GTA. When such an offer is made and it is envisioned that the new GRA will return to GTA status in the future, arrangements for such a return to GTA status must be made in advance with the Department Chair. Such arrangements should be made in writing. It is the student's responsibility to see that such arrangements are formalized before a change in status is made. Graduate

students should not relinquish a GTA for a GRA until such arrangements have been made.

Both GTAs and GRAs must make normal academic progress to be eligible for renewal of their assistantships. Guidelines for normal academic progress follow. **All GTAs and GRAs are required to register for 15 credit hours per term.**

A. *Qualifying examinations and continued support*

A student who receives a grade of "Pass" on the qualifying exam at the beginning of the second year of study and who is admitted to the Ph.D. program in mathematics during that year can normally expect to receive support as a GTA during the coming academic year.

A student who receives a grade of "Fail" on the qualifying exam at the beginning of the second year of study normally will not be admitted to the Ph.D. program in mathematics during that year. However, the student may receive support as a GTA during the third academic year if his/her overall record merits such support and if the student applies for and receives a provisional admission to the Ph.D. program. A student supported in this way will be expected to pass the qualifying exam at the next opportunity to be eligible for further support.

A continuing student who does not take the qualifying exam at the beginning of the second year of study will not be admitted to the Ph.D. program in mathematics during that year. Normally such a student will not receive support as a GTA during the coming academic year. A student in this situation should discuss his/her future plans with the chair of the graduate committee. Such a student may appeal to the graduate committee for support for a third year if special circumstances warrant such support.

B. *Guidelines for expected academic progress:*

The parenthetical material that follows refers to the Graduate Catalog of the Graduate School.

1. **For GTAs entering OSU without a Master's Degree in Mathematics:**

1st Year:

a) Complete a program of study approved by the Graduate Committee;

b) File a Master's degree program. (The Graduate Catalog states that the program should be filed within completing 18 hours of graduate credit.)

2nd Year:

Students who do not plan to enter the Ph.D. program should complete all requirements for the Master's degree, possibly including work during summer term of the 2nd year. Students seeking support for a third year of study must be admitted to the Ph.D. program or must appeal to the graduate committee for a third year of support.

Students who do plan to enter the Ph.D. program should:

a) Pass the Ph.D. qualifying examination,

b) Complete at least one Ph.D. core sequence,

c) Apply to the Graduate Committee for admission to the Ph.D. program by submitting a letter of intent and obtaining two letters of recommendation from the faculty, and

d) File a change of degree program form with the Graduate School.

Students who are admitted to the Ph.D. program may defer completion of the Master's degree until the third year.

3rd Year:

a) Complete the qualifying examination requirement if not already done.

b) File a Ph.D. program. (The Graduate Catalog states that a Ph.D. program must be filed no later than the end of the 5th term of enrollment as a Ph.D. student.)

4th Year:

a) Satisfy foreign language requirement.

b) Pass Ph.D. Oral Preliminary Examination.

5th Year:

Demonstrate likelihood of completing the Ph.D. program in the sixth year.

2. For GTAs entering OSU with a Master's Degree in Mathematics:

1st Year:

Complete a program of study approved by the Graduate Committee. (The Graduate Catalog states that a Ph.D. program must be filed within one calendar year of enrollment as a Ph.D. student.)

2nd Year:

a) File a Ph.D. Program.

b) Complete the qualifying examination requirement.

3rd Year:

a) Satisfy the foreign language requirement.

b) Pass the Ph.D. Oral Preliminary Examination

4th Year:

Demonstrate likelihood of completing the Ph.D. program in the fifth year.

Thus, GTAs entering with a Bachelor's (Master's) degree who maintain a good academic record, make timely progress toward the Ph.D., and satisfactorily perform their assigned duties can reasonably expect 6 (5) years of support as a GTA.

c. *Teaching Assignments.*

The Department attempts to assign a graduate teaching assistant to the best possible class for his/her interests and strengths. A GTA may be assigned recitation sections of a large lecture class and be asked to assist with quiz preparation and grading for the class. Some GTAs will teach their own classes and advanced doctoral students may be assigned as a consultant for a graduate class. Office hours and tutoring time in the Mathematics Learning center may be required. Occasionally, a GTAs principal assignment may be to work in the

Mathematics Learning Center or to be a grader for an advanced undergraduate or core graduate course. The specific duties assigned will be determined by the Chair of the department. Specific requests for assignments should be addressed to the department course scheduler.

D. *GTA Salaries.*

There are two salary levels for GTAs with a regular appointment. Salaries quoted here are for 2002-2003.

Level 1. GTAs who have not passed the Ph.D. Preliminary Examination: $11,500.
Level 2. GTAs who have passed the Ph.D. Preliminary Examination: $12,500.

GTAs do not pay tuition. They are required to pay student fees each term.

E. *Course Loads.*

All GTAs and GRAs are required to register for 15 credit hours per term. In addition, the courses selected must satisfy the following departmental requirements.

- *Each first year GTA must take three non-blanket numbered courses each term including two each term in the mathematics department.*

- *Each second year GTA must take two non-blanket numbered courses each term including at least one in the mathematics department. Courses not on the student's program may be taken on a Pass – No Pass or S/U basis.*

- *Each third and fourth year GTA must take one non-blanket numbered course each term in the mathematics department. This course may be taken on a Pass – No Pass or S/U basis.*

- *Each fifth or sixth year GTA must take two non-blanket numbered courses **per year**. These courses may be taken on a Pass – No Pass or S/U basis.*

When the Graduate Committee considers renewal of a GTA, the GTA will have made satisfactory progress as far as course work is concerned if the non-blanket course requirement is met each term with an overall grade point average of 3.0 or higher.

Programs of study will be collected the first week of fall term. The major professor must approve any changes to a study program and a signed and approved updated program must be filed with the Graduate Committee in the term when the changes are made.

While many GTAs take minor area courses outside the department, each GTA is required to register for a minimum of 6 hours of Mth 5xx, Mth 6xx per term and a minimum of 21 credit hours of such courses per year. Any deviation from this policy MUST have the PRIOR approval of the Graduate Committee. The committee encourages study outside the department when it contributes substantially to the overall mathematical development of a student. The department does not support course work outside of mathematics that is taken for general educational purposes.

F. *Summer Term GTAs.*

About 7 to 12 summer term GTAs are available each year. To be considered for a summer term GTA, a student must have satisfactory teaching experience as determined by the Departmental Teaching Committee and a satisfactory academic record as determined by the Graduate Committee. Candidates who are otherwise qualified will be ranked according to the following scheme:

1. Needs of the department and special cases as identified by the mathematics summer term director.

2. Non-first year GTAs who have not taught summer school at OSU before.

3. GTAs who last taught summer school at OSU three or more summers ago.

4. GTAs who last taught summer school at OSU two summers ago.

5. GTAs in their first year at OSU.

6. GTAs who taught summer school at OSU the prior summer.

Candidates in the first category above receive top priority, and so on, down the list. Candidates who are in the same category may be distinguished on the basis of academic record and teaching record, on the basis of a coin toss, or on the basis of who answers the phone first in cases where appointments must be made on short notice. The Graduate Committee and Director of Summer Term will assess qualifications.

Summer GTAs must register for at least nine credits in mathematics, and this must include Mth 507. Reading and Conference (505/605), Projects (506/606), Thesis (503/603), Research (501/601), and regular courses, as appropriate, may be used to make up the remainder. Summer GTAs who wish to register in non-mathematics courses as part of the 9 credits MUST obtain PRIOR approval from the Mathematics Director of Summer Term. Otherwise, the GTA may be billed for courses taken outside the department. (During Summer Term, the department is only reimbursed for your tuition to the extent that the student takes courses with the Mth designator.)

Summer term GTAs teaching in the 8-week session must schedule 3 to 4 contact hours per week in addition to regular class hours. At least 2 of these hours must be in the Mathematics Learning Center. The MLC duty is important to the functioning of the MLC. GTAs are expected to show up promptly for their assigned time slots. GTAs teaching a 4-week course should schedule 5 out-of-class contact hours per week. A GTA who completes a degree program during a given summer is eligible for up to 12 hours of summer term tuition remission during that term. A GTA who completes a Master's degree in the Spring and is not admitted to the Ph.D. program is not eligible to teach as a GTA during the summer. All GTAs with appointments for both the proceeding Spring Term and following Fall Term are eligible for up to 12 hours of summer term tuition remission. More information on the Summer Study Privilege is available from the Graduate School.

POSTBACCALAUREATE STUDENTS

A Postbaccalaureate student is a student who is working for a second undergraduate degree. For academic purposes, they are undergraduate students, but they also must meet certain Graduate School requirements. Questions concerning Postbaccalaureate work should be directed to the Mathematics Head Undergraduate Advisor. Postbaccalaureate students should check with the Graduate School about restrictions on graduate transfer credit.

A SYNOPSIS OF INSTITUTIONAL REQUIREMENTS

Graduate students must become familiar with the requirements and regulations of the Graduate School. A few of the more important ones are listed here.

- The maximum load for a graduate student devoting full time to graduate study is 16 hours. For teaching and research assistants, the minimum load is 15 term hours. Students may be charged for credits taken in excess of the maximum 16 credit hours. The university performs audits each summer.
- A graduate student must enroll for at least 3 term hours in any term that the student uses university space or facilities, or is supervised by a major professor.

Courses numbered 501 or 601 (Research), 503 or 603 (Thesis), 505 or 605 (Reading and Conference), 506 or 606 (Projects/Special Topics),507 or 607 (Seminar) are called "Blanket Numbered Courses". All other courses are non-blanket numbered courses. Other than thesis credits, no more than 6 blanket hours are allowed on a Master's program and no more than 15 on a Ph.D. program. Thesis credit (course number 503 or 603) is limited to 12 hours on Master's programs and to 72 hours on Ph.D. programs. If a student wishes to deviate from the normal Graduate School regulations, the student may petition the Dean of the Graduate School.

GRADUATE COURSE OFFERINGS

Listed below are the graduate courses offered by the Mathematics Department. See the University catalog or the department's web pages for course descriptions.

Blanket Numbered Courses:

501, 601	Research		503, 603	Thesis
505, 605	Reading and Conference		506	Projects
507, 607	Seminar		606	Special Topics

Non Blanket Numbered courses:

510	Occupational Internships
511-12-13	Real Analysis
519	Integral Transforms
520	Tensors and differential forms
521-22-23	Principles of Continuum Mechanics
528	Variational Problems
534-35-36	Differential Geometry
537	General Relativity
540	Computational Number Theory
541-42	Applied and Computational Algebra
543	Abstract Linear Algebra
551	Numerical Linear Algebra
552	Numerical Solution of Ordinary Differential Equations
553	Numerical Solution of Partial Differential Equations
558	Computational Mathematics
563-64-65	Theory of Probability
567	Actuarial Mathematics
573	History of Mathematics
591-92-93	Algebra and Geometric Transformations
599	Topics in Mathematics
611-12-13	Complex Analysis
614-15-16	Functional Analysis
619	Topics in Analysis
621-22-23	Differential and Integral Equations of Mathematical Physics
624-25-26	Differential Equations and Dynamical Systems
627-28-29	Partial Differential Equations
631-32-33	General Topology and Fundamental Groups
634-35-36	Algebraic Topology
639	Topics in Topology
644-45	Abstract Algebra
649	Topics in Algebra and Number Theory
654-55-56	Numerical Analysis
657	Topics in Applied mathematics
658	Topics in Mathematical Modeling
659	Topics in Numerical Analysis
664-65	Probability
668	Topics in Actuarial Science
669	Topics in Stochastic Processes
674-75-76	Differential Geometry of Mathematics
679	Topics in Geometry
680	Modern Approaches to Calculus
681	Modern Approaches to Euclidean Geometry
682	Teaching and Learning Probability and Statistics
683	Graphing Calculators in Precalculus Mathematics
684	Computers and Mathematics
685	Advanced Problem Solving
689	Topics in Mathematics Education
699	Topics in Mathematics

GRADUATE FACULTY

This section lists current graduate faculty of the Department of Mathematics together with the date and university where they earned their advanced degree and their field of expertise. More information is available on the department's web pages as explained on page two of this pamphlet.

W.A. Bogley,   Ph.D., Oregon, 1987.
                      Algebraic topology.
R.M. Burton,   Ph.D., Stanford, 1977.
                      Probability, ergodic theory,dynamical systems.
L.K. Chen,   Ph.D., Chicago, 1986.
                      Harmonic analysis, singular integral equations.
T.P. Dick,   Ph.D., New Hampshire, 1984.
                      Mathematics education.
T. Dray,   Ph.D., UC, Berkeley, 1981.
                      General relativity and differential geometry.
B.S. Edwards,   Ph.D., Pennsylvania State, 1996,
                      Mathematics Education.
C.M. Escher,   Ph.D., Pennsylvania, 1993.
                      Differential geometry.
A. Faridani,   Ph.D., WWU Muster, FRG, 1988.
                      Tomography, numerical analysis, and signal processing.
D.V. Finch,   Ph.D., MIT, 1977.
                      Inverse problems, tomography.
M.E. Flahive,   Ph.D., Ohio State, 1976.
                      Number theory, combinatorial algebra.
D.J. Garity,   Ph.D., Wisconsin, 1980.
                      Geometric Topology
R.B. Guenther,   Ph.D. Colorado, Boulder, 1964.
                      Applied mathematics.
R.L. Higdon,   Ph.D., Stanford, 1981.
                      Partial differential equations, numerical analysis.
J.W. Lee,   Ph.D., Stanford, 1969.
                      Differential and integral equations.
L.F. Murphy,   Ph.D., Carnegie-Mellon, 1980.
                      Applied mathematics, biomathematics, modeling.
M. Ossiander,   Ph.D., Washington, 1985.
                      Probability.
H.R. Parks,   Ph.D. Princeton, 1974.
                      Geometric measure theory, minimal hypersurfaces.
B.E. Petersen,   Ph.D., MIT, 1968.
                      Partial differential equations, pseudo differential operators.
J. Pohjanpelto,   Ph.D., Minnesota, Minneapolis, 1989.
                      Partial differential equations.
                      Real algebraic geometry, algebra, number theory.
T. A. Schmidt,   Ph.D., Pennsylvania, 1989.
                      Number theory
D.C. Solmon,   Ph.D., Oregon State, 1974.
                      Image reconstruction, transform theory, applied analysis.
E. Thomann,   Ph.D., UC, Berkeley, 1985.
                      Partial differential equations and applications.
E. Waymire,   Ph.D., Arizona, 1976.
                      Probability, mathematical physics, geophysics.

COURSE PLAN FORM

Course Plan for Academic Year _____

*Student's Name:*_____

All GTAs and GRAs must file a course plan with the Graduate Committee for the academic year during the first week of Fall term (see graduate pamphlet). These program plans will be kept in the student's file. The forms should be turned in to the graduate chair after they are filled out and signed.

The major professor must approve and sign the form. Any changes to the program during the year must be approved and signed by the major professor on an updated form. Changes should be filed by the end of the first week of the term in which the change occurs. A member of the graduate committee takes the place of the major professor for those students who have not yet filed programs.

GTAs and GRAs are expected to sign up for 15 credits including possibly Mth 506 (tutoring in the MLC) and Mth 507M (seminar for graduate math majors).

Course Plan for academic year_____:

Course	Term (F, W, or S)	Time	Credits
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			

Comments:

Student's Signature _____

Advisor's Signature _____

Date: _____

GRADUATE PERSONAL INFORMATION SHEET

Graduate Student Mathematics Department Information Sheet, Year_____
Name:_____

Local Address _____

               _____

Local Phone _____

E-mail _____

Term and year that you started as a graduate student here:
_____

Degree Program that you are in: _____

When do you expect to finish the degree that you are working on?
_____

Do you anticipate requesting support for the next Academic Year? Your answer to
this can change later in the year. _____

Undergraduate institution: _____

Year of undergraduate degree: _____

Do you have a Master's Degree? _____

If you have a Master's Degree, when and where did you receive it?
_____

Title of Master's paper or thesis:
_____

Who was your major professor for your master's degree?
_____

Who is your major professor for the degree that you are working on?
_____

Have you filed an official program with the graduate school?
_____

Have you passed any qualifying exams? If so, which exams and when?
_____

Have you taken your Oral Preliminary Exam for the Ph.D. ? If so, when?
_____

Have you passed any foreign language exam? Is so, which ones and when?
 _____