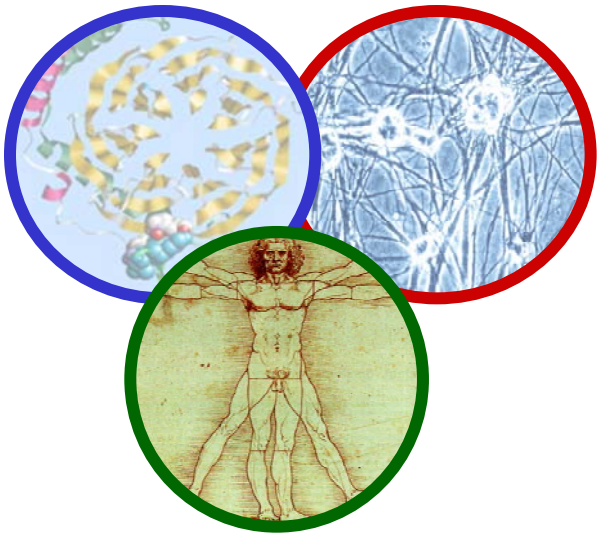

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Rev. 2/07

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1. Preface

This handbook summarizes the policies of the graduate program in the Department of Pharmacology and Physiology. The general policies for graduate study at the University of Rochester are contained in the *Official Bulletin of Graduate Studies* and in the *Student Handbook of the School of Medicine and Dentistry*. Copies can be obtained from the Graduate Studies Office of the School of Medicine and Dentistry or from the Departmental graduate coordinator. Since policies continually evolve to respond to changing needs of the graduate program and our students, and it is imperative that students and faculty advisors verify important decisions with the Director of Graduate Studies.

2. Program Objective

The objective of the graduate programs in pharmacology and physiology at the University of Rochester is to provide a state-of-the-art learning environment in which students explore the molecular and cellular mechanisms that enable organisms to detect and respond to signaling molecules and pharmacologic agents. Each student will acquire the range of technical, analytical, and critical skills required to successfully pursue a research career in academia or in the biotechnology/pharmaceutical industry. The program offers Ph.D. degrees in both Pharmacology and Physiology. The Ph.D. degree is awarded upon completion of scholarly work and research described in a publishable dissertation.

3. Program Administration

The graduate program in pharmacology and physiology is administered by the Director of Graduate Studies, the Graduate Studies Committee, and the faculty of the Department of Pharmacology and Physiology. The day-to-day activities of the program are managed largely by the Director of Graduate Studies. The review and acceptance of applicants into the program and the review of students enrolled in the program is the responsibility of the Graduate Studies Committee. The Pharmacology and Physiology faculty will participate in major policy decisions concerning the graduate program.

4. Doctoral Programs in Pharmacology and Physiology

A. Enrollment: Students will enter the Graduate Program in Pharmacology and Physiology following completion of their first-year of study in one of the graduate research clusters in the Graduate Education in the Biomedical Sciences (GEBS) program. The objective of the Graduate Program in Pharmacology and Physiology at the University of Rochester is to train scientists in molecular and integrative pharmacology and physiology and prepare them for successful careers in independent research and teaching. The program offers Ph.D. degrees in both pharmacology and physiology and includes courses in basic and advanced biomedical sciences, pharmacology, and physiology; original laboratory research; and the preparation and defense of a doctoral thesis. After successful completion of their first year of study, students choosing to enter into the Graduate Program in Pharmacology and Physiology must designate a thesis advisor and Ph. D. track (Pharmacology or Physiology). The selection of a thesis advisor requires approval by the Director of Graduate Studies and the Graduate Studies Committee. A faculty member may not be able to accept a student for some of the following reasons: (1) insufficient laboratory space or facilities; (2) lack of funds to support research; (3) commitments that prevent the faculty member from devoting sufficient time to the student's training and education; and (4) plans for a sabbatical leave. Students wishing to make a change in their selection of thesis advisor must petition the Director of Graduate Studies and provide the Graduate Studies Committee with the rationale for electing a different advisor.

B. Laboratory Rotations: All students must successfully complete at least three laboratory rotations before entering the program. Under most cases, these rotations will have been completed during the student's first year of study as a member of one of the GEBS graduate research clusters. These laboratory rotations serve to provide an opportunity to gain a broader perspective of the sciences of pharmacology and physiology and, at the same time, become familiar with the diverse investigative activities being pursued within the University of Rochester Medical Center.

C. Courses: The following courses, or acceptable equivalents as determined by the Graduate Studies Committee, are required of all Ph. D. candidates:

Required Courses		Total Credits
IND 408	Biochemistry	5
IND 409	Cell Biology	4
IND 410	Molecular Biology	4
PHP 403	Cell and Molecular Physiology	3
PHP 404	Principles of Pharmacology	4
PHP 502	Seminar (4 semesters)	4
IND 501	Ethics in Research	1
	Total Required	25 Credits

Recommended Courses (At Least 6 Credits)		Total Credits
IND 447	Signal Transduction	4
PHP 440	Topics in Vascular Biology	2
PHP 520	Frontiers in Mitochondrial Medicine	2
PHP 550	Ion Channels and Disease	2
PHP 530	Advanced Topics in Pharmacology	2
ANA513	Neuroinflammation	4
PTH 593	Molecular Mechanisms of Human Disease	4
STT 463	Introduction to Biostatistics	4
	Total Required	31 Credits

The Department of Pharmacology and Physiology Director of Graduate Studies and the student's thesis advisor will counsel students regarding the appropriate selection of elective courses. Requests to take elective courses that are not on the recommended list require approval of the Graduate Studies Committee. Requests for approval should be made prior to the semester in which the course is held.

D. Grades and Student Performance: All required courses, with the exception of PHP 502, PHP 595, and IND 501 must be taken on the A/E system; PHP 502, PHP 595, and IND 501 are taken on the S/E system.

A/E SYSTEM	S/E SYSTEM
A = Excellent	S = Satisfactory
A-	E = Failure
B+	I = Incomplete
B = Good	IE = Incomplete and Failure
B-	W = Withdrawn
C = Poor	N = No report
E = Failure	
I = Incomplete	
IE = Incomplete and Failure	
W = Withdrawn	
N = No report	

Minimum passing grades for courses and research carrying credit are C or S, although C is considered a failure for any student on probation. Any student with a grade-point average below 3.0 or who receives a grade of C in two courses (or one course with eight hours of credit) is considered to have an unsatisfactory record and may, after review by the departmental Graduate Studies Committee, be dropped from the program. The Graduate Studies Committee reviews the academic performance of each graduate student at the end of each term.

E. Departmental Seminars and Lectures: ***Attendance at all Department of Pharmacology and Physiology seminars and lectures is required, until the requirements for the Ph. D. are completed.*** Each student is also required to enroll in PHP 502 for a total of at least four semesters. Seminar topics will consist of research problems in pharmacology, physiology, and rotation progress reports. Topics will be chosen by the course director or by the student with approval of the course director.

During the fall semester of the second year of graduate work (first year in the Graduate Program of Pharmacology and Physiology), students will present a literature seminar of his/her choice. For the spring semester, students will present a research/literature seminar designed to incorporate some of their preliminary laboratory research in conjunction with relevant recent literature. Second year students should submit an annual progress report signed by their advisor. Qualifying exam (seminar) is the only seminar required during the third year of graduate work.

During years following the Qualifying Examination, an open oral research seminar (progress report) will be delivered in conjunction with the required yearly Dissertation Advisory Committee meetings.

F. Qualifying Examination: Students, after consultation with their faculty advisor, will submit a list of prospective committee members to the Department of Pharmacology and Physiology Director of Graduate Studies during their second year of study. This list should consist of two faculty members from the Department of Pharmacology and Physiology (Primary or Secondary) and one faculty member from outside the department. After reviewing/approving the list of proposed committee members, The Director of Graduate Studies and the Graduate Studies Committee will determine the composition of the student's Qualifying Examination Committee. This committee will generally consist of the proposed committee members plus two additional Department of Pharmacology and Physiology primary faculty members appointed by the Graduate Studies Committee (for a total of 5 members). At least one of the members of the Qualifying Examination Committee should also be a member of the Graduate Studies Committee. The student's research advisor is not a member of the Qualifying Examination Committee, but should meet briefly with the committee just prior to the examination.

The aim of the research proposal/qualifying examination is to assess the student's general knowledge of the broad aspects of pharmacology and physiology and to test the student's ability to apply this knowledge to the solution of research problems. Students are expected to propose a logical series of experiments designed to test a stated hypothesis and to defend their proposed approach/ideas. The examination is **not** intended to be an abridged thesis defense, and therefore, limited preliminary data is required. The examination is closed. The student will submit a brief (ten-page maximum) outline of the research project in the NIH grant-proposal format (specific aims, background and significance, preliminary studies, research design and methods, references) to the examining committee at least one week prior to the examination. Students must deliver a ~45 minute open proposal seminar prior to the closed examination. During this seminar, students should clearly state the hypothesis to be tested by the specific aims of the proposed project, provide justification for the research through consideration of published literature and/or preliminary data, and clearly outline the proposed line of experiments and anticipated results. Students should make every attempt to schedule their open seminar during the Student Colloquium Series (PHP 502). However, in some instances scheduling constraints may require the open seminar and exam to be scheduled at an alternate time. During the closed examination, students will be evaluated by their ability to satisfactorily answer questions raised by committee members that focus primarily on the following issues:

- Does the proposed research project address a valid and important scientific question?
- Has a central hypothesis been clearly stated? Is the hypothesis supported by published literature and/or preliminary data?
- Does the student have a broad and firmly based knowledge of the literature related to the area of research?
- Do the proposed methods appropriately address the hypothesis? Are the questions likely to be answered by the proposed approach?
- Are the proposed methods feasible? Does the student understand the limitations of the proposed techniques and possible technical obstacles? Does the student have alternate approaches in mind?
- Can the student clearly describe the predicted results and competently interpret the multiple possible outcomes of the experiments?
- Is it likely that the project could be completed within the requisite time frame?
- Is the scientific significance/importance of the question clearly stated? Is the relevance of this information to human health/disease clearly expressed?

The oral qualifying examination may be scheduled as early as the spring of the second year of study, **but must be completed no later than Dec. 1st of the third academic year.** If a student fails the examination, he/she may be given an opportunity to retake the exam once. However, students

failing to complete the qualifying examination prior to Dec. 1st of their third year of study may jeopardize their opportunity to retake the exam. Given scheduling constraints, students should allow plenty of time to arrange with their Qualifying Examination Committee the date, time, and location of the qualifying examination. In addition, the student must submit 2 forms (available from the Departmental graduate coordinator) along with an Abstract and Title Page to the Senior Associate Dean for Graduate studies requesting that the examination be scheduled. This form must be sent no later than two weeks before the scheduled examination.

G. Dissertation Advisory Committee: After the student has passed the Qualifying Examination, the Dissertation Advisory Committee will be formed. This will usually involve dropping the two committee members appointed by the Graduate Studies Committee and adding the thesis advisor (making a total of 4 committee members). However, the student and his/her thesis advisor may petition the Director of Graduate Studies and the Graduate Studies Committee to alter the composition of the Dissertation Advisory Committee in order to reflect changing needs of the student's research project. The Dissertation Advisory Committee should be consulted during conception of the thesis problem, execution of the thesis research, and the writing of the thesis. The Dissertation Advisory Committee must convene at least once yearly (starting with the academic year following the successful completion of the Qualifying Examination) during the student's tenure. During these meetings, the committee will discuss the student's progress and clarify research problems. A written report of the student's progress must be submitted to the Senior Associate Dean for Graduate Studies after approval by the committee. **Students should obtain a Progress Report Form** from the Departmental graduate coordinator prior to each committee meeting.

H. The Remaining Years: The remaining years of graduate study will be spent on full-time research developing the research project that will be described in the Ph. D. thesis. The research advisor and Dissertation Advisory Committee play a key role during these years. The Senior Associate Dean for Graduate Studies and the Department of Pharmacology and Physiology **requires an annual meeting of the Dissertation Advisory Committee** to discuss research progress. In conjunction with the yearly Dissertation Advisory Committee meetings, an open oral research seminar is expected. Usually, students should schedule the annual meeting of their advisory committee to follow their research seminar. The annual progress report (signed by all committee members) can usually be submitted after this meeting.

I. Teaching: Students are expected to assist in Departmental organized laboratory exercises conducted as part of the Medical Education curriculum. Typically this will involve assisting in the supervision of a cardiovascular pharmacology cat-lab offered to medical students each year. Although third-year students will be asked to organize/direct the lab for that year, all DPP graduate students are expected to participate as Teaching Assistants during the labs.

5. Thesis Preparation and Defense

A. Thesis Format: After the student's Dissertation Advisory Committee and advisor have approved the completion of the thesis research, the appropriate form should be signed and delivered to the Departmental graduate coordinator. When the student is ready to write the thesis, he or she should go to the following website (**http://www.rochester.edu/theses/**) to print out a copy of the booklet *"The Preparation of Doctoral Theses, A Manual for Graduate Students."* This booklet outlines the University's requirements for format, documentation, and the physical form of the thesis. The student must prepare the thesis to meet the requirements set forth in this booklet. A copy of the Thesis Defense Timetable, which outlines University deadlines for registering a doctoral thesis, is included in the appendix of this Graduate Student Handbook.

Students should consult with their advisor prior to writing the thesis to reach an agreement about the format and content of the thesis. The advisor has the ultimate responsibility and authority to determine the format of the student's thesis.

B. Registration of the Ph.D. Thesis and Final Oral Examination:

1. Arrange with the Dissertation Advisory Committee for the date, time, and place of the thesis defense. Notify the Departmental graduate coordinator of the date of the defense **at least six weeks in advance**.
2. The Departmental graduate coordinator will certify to the Senior Associate Dean for Graduate Studies that all requirements have been fulfilled (*i.e.*, that an official undergraduate transcript is on file, that any name changes are on record (a copy of a marriage certificate, if it effects a change in name, may be needed, etc.).
3. **Five weeks before the scheduled examination**, students must provide the Departmental graduate coordinator the following information:

(a) A form (available from the Departmental graduate coordinator) signed by the thesis advisor that states approval to register the thesis.
(b) A statement (available from the Departmental graduate coordinator) signed by the Director of Graduate Studies that certifies that the student has completed all departmental requirements for the Ph.D. degree.
(c) A form to request assignment of an examination date by the Senior Associate Dean for Graduate Studies.
(d) A completed "Program of Study Form" signed by the Director of Graduate Studies that lists all of the courses that the student has taken.
(e) A copy of the thesis abstract.
(f) A copy of the title page.
(g) E-mail addresses of committee members

4. The Senior Associate Dean for Graduate Studies will give the student a microfilm contract and a diploma card. Both must be completed, signed, and returned to the Senior Associate Dean for Graduate Studies. The Department of Pharmacology and Physiology will pay to microfilm the thesis.
5. The student must deliver copies of the dissertation to the Dissertation Advisory Committee no later than **two weeks before the defense date**. *(Student must contact the Departmental graduate coordinator **before making copies of their theses** so that copy charges are made to the correct account.)*

6. After a successful defense, the student must make the corrections requested by the Examining Committee. Four copies of the corrected thesis should then be prepared. One unbound copy of the dissertation should be submitted to the Senior Associate Dean for Graduate Studies Office. The Pharmacology and Physiology Department will bind three copies of the dissertation: one each for the student, the advisor, and the Department of Pharmacology and Physiology library. The student should deliver the three copies to be bound to the Departmental graduate coordinator. For graduate students-in-residence, only two bound copies are needed – one for the student and one for the advisor. *(Student should come to the office to obtain University water- marked paper for final printing of bound theses.)*

C. Final Oral Examination: The Final Oral Examination will be taken after completion of all other requirements for the degree, but not earlier than six months after passing the cumulative and oral qualifying examinations. The examination consists of two parts: the first part is a public seminar that describes the work presented in the dissertation. The second part of the examination takes place immediately after the seminar and after all questions have been satisfactorily answered. The student will then meet privately with the Dissertation Advisory Committee to defend the dissertation.

Note: *Please be sure that the Departmental graduate coordinator receives a copy of any correspondence between your advisor and the Senior Associate Dean for Graduate Studies Office that concerns your qualifying examinations and thesis registration. It is important that accurate records be kept within the department on the status of each student.*

6. General Policies

A. Advisor's Responsibilities: Advisors are expected to meet regularly with trainees to assess their academic and research progress. The advisor should set reasonable expectations for performance in the laboratory, should assist the student in gaining access to needed equipment and facilities, and should discuss potential or actual problems with the Departmental Graduate Studies Committee.

B. Student's Responsibilities: Students are expected to comply with departmental and graduate school regulations concerning deadlines and the convening of Dissertation Advisory Committee meetings, to meet the academic performance expectations of the University, to attend all departmental seminars, and to pursue their thesis research vigorously. All research laboratories require that student's maintain up-to-date records of their experimental work. The research notebooks are the property of the student's advisor.

The *" Regulations Concerning Graduate Study"*, contains more detailed information than is provided in this handbook, and students are expected to be thoroughly familiar with these regulations. This Bulletin is available from the Departmental graduate coordinator.

C. Right of Petition: Students have the right to petition the Departmental Graduate Studies Committee to make changes in their program or to deviate from the guidelines contained in this handbook.

D. Vacations/Holidays: Graduate students are expected to engage in full-time study and research. NIH guidelines and official University of Rochester policy provides graduate students with 2 weeks (10 business days) of vacation per year, as well as fixed University holidays. Students are not permitted to take more than two weeks of vacation at any one time. Any student requesting an exception to this policy must submit a written request to both the Director of Graduate Studies and the Senior Associate Dean for Graduate Studies. In all cases, the student's advisor or the Director of Graduate Studies (for students whose advisor is unavailable) should be consulted about planned vacations. Students are also entitled to official University holidays and a reasonable amount of sick days.

E. Travel: For Pharmacology and Physiology graduate students who are supported by a Pharmacology and Physiology **primary** faculty during the graduate student's tenure, the department may provide up to $500 towards attendance at a national scientific meeting(s). The request (available from the Departmental graduate coordinator) must be approved by the student's advisor and submitted to the Director of Graduate Studies through the Departmental graduate coordinator. Departmental travel support will normally be granted only when the student is presenting research results at the meeting.

F. Supplies and Photocopying: In general, students will use research supplies available in the advisor's laboratory. All purchases must be approved by the research advisor. Photocopying is charged to the laboratory's copy card. If the student does not have access to a card or if the student is required to copy course material, a copy card is available in the Pharmacology and Physiology Department Office.

G. Telephones: The University does not allow personal long-distance phone calls to be made from the office or the laboratory. There is no mechanism for an individual to be charged for the calls or to reimburse accounts.

7. Program for Masters Degree in Pharmacology or Physiology

A. General:

(1) All “required courses” as outlined for the Ph.D. program in Section 4C.
(2) Four credits of seminar (PHP 502).
(3) A minimum of 30 hours of graduate credit.

B. Plan A:

(1) 6 additional credit hours of research credit.
(2) Preparation of a dissertation based in part on original material that displays thorough acquaintance with a limited subject.
(3) Successful completion of a final oral examination that focuses on the thesis defense, but may include examination of general competency in pharmacology or physiology.

C. Plan B:

(1) 6 additional credit hours of elective A/E course credit from the list outlined for the Ph.D. program in Section 4C.

(2) Completion of the written examination requirement, which will be satisfied by the preparation of the Master's Essay that presents a critical review of a topic of current pharmacologic or physiologic relevance. Maximum length of 5 pages excluding references.

(3) Successful completion of a comprehensive oral examination in pharmacology and physiology. The Ph.D. oral qualifying examination will also fulfill this requirement.

8. M.D. / Ph.D. Combined Degree Program

During their second year of study, M.D. / Ph.D. students should discuss entry into the Ph.D. program with the Director of Graduate Studies of the Department of Pharmacology and Physiology. The Ph.D. portion of their combined degree program will begin after successful completion of the first two years of the Double-Helix Curriculum. M.D. / Ph.D. students should expect to successfully complete 2-3 laboratory research rotations, at least one with a primary faculty member in the Department of Pharmacology and Physiology, during the first two years of the Double-Helix Curriculum.

The Ph. D. portion of the M.D. / Ph.D. program will build on previous background acquired in the Medical School curriculum. Because of this, certain course requirements of the traditional Ph. D. track outlined above will be waived and advanced courses may be substituted to provide depth in an area of specialization. M.D. / Ph.D. students are granted 30 credits toward the 90 credit requirement for the Ph.D. on the basis of their basic science courses in the medical curriculum. Students who consider that their background may permit exemption from other core curriculum courses in Pharmacology and Physiology should request such an exemption. Each M.D./Ph.D. student must complete at least one of the following three Core Courses: 1) IND 408 Biochemistry (5 CR), 2) IND 409 Cell Biology (4 CR), or 3) IND 410 Molecular Biology (4 CR). M.D. / Ph.D. students must also complete each of the following additional courses: 1) IND/PHP 447 Signal Transduction (4 CR), 2) PHP 502 Seminar (4 semesters) (1 CR), and 3) IND 501 Ethics and Professional Integrity (1 CR). Finally, M.D. / Ph.D. students must complete an additional 4CR of upper-level A/E credit selected from the recommended courses listed in Section 4C above.

M.D. / Ph.D. students must also successfully complete the Departmental Qualifying Examination by 12/1 of their 4th year of study in the M.D. / Ph.D. program (as described in Section 4F above) and then meet annually with their Dissertation Advisory Committee thereafter. During these meetings, the committee will discuss the student's progress, clarify research problems, and outline priorities of future research directions. Thesis preparation and defense requirements are the same as those listed in Section 5 above.

9. Ph.D. Degree Program for Post-M.D. Students in the Training Anesthesiologists as Physician Scientists Program (TAPS)

It is possible to obtain Ph.D. training after obtaining the M.D. degree. The Department of Anesthesiology coordinates and supports a graduate research training program that leads to a Ph.D. degree in a basic science, and the Department of Pharmacology and Physiology participates in this program. Anesthesiology residents or fellows in the TAPS program can use credits obtained during medical school towards the course requirements of the Ph.D. degree as defined above. The program for training is individualized for the student depending on their background and previous experience. Thus the specific course requirements are defined during the application process. Once accepted, students usually rotate through 3 laboratories before selecting an advisor.

Participants will be allowed to complete the requirements for residency or fellowship while working on the Ph.D. degree and would also be permitted to work one day per week clinically once they have finished their clinical training.

THESIS DEFENSE TIMETABLE

- **All paperwork for Ph.D. defenses must be submitted to the Offices for Graduate Education at least 10 full working days prior to the date of thesis registration (or at least 25 full working days prior to the defense date) during the fall and spring semesters. Contacting your graduate coordinator before scheduling your defense ensures the timely delivery of your paperwork.**

6 (six) weeks before: (approximately)

- Notify me, Linda Fullington, and Linda Lipani in the Offices for Graduate Education, with your date of defense.

5 (five) weeks before or 25 FULL working days prior to the defense date: (see Linda Fullington)

- Departmental Statement on Completion of Requirements form
- Ph.D. Advisor Permission Form
- Abstract and title page
- Appointment form for Ph.D. Final Oral Examination
- Program of Study (courses completed - see transcript)

NOTE: Acknowledge source of support in "Acknowledgements" in thesis

- Req. for Payment for "Proquest" for microfilm fee
- Ph.D. Defense Committee E-mail Addresses

16 (sixteen) working days before defense: (21 working days FOR A SUMMER DEFENSE)

"In addition to Saturdays and Sundays, a day when the University is officially closed cannot be counted as a working day (i.e.holidays). A student cannot count the actual day of the Ph.D. defense or any portion of it as one of the required full working days. A student also cannot count the day or any portion of it that the dissertation is being registered in my office" per Linda Lipani.

- Student registers thesis (make appointment with Linda Lipani in OGE to complete additional forms ie., UMI microfilm, alumni survey, exit form).

- Bring thesis (1 copy) to be submitted.
  (follow the guidelines for **The Preparation of Doctoral Theses** - this document is now on the web: **http://www.rochester.edu/Theses/).** Thesis put in binder.
  PLEASE NOTE: Beginning Spring 2006, you will also be required to submit one complete copy of your dissertation in digital format along with a signed authorization form.

- Hand deliver to Vice Provost's office by 4:00 p.m. that day (River Campus)

- (1) copy for each committee member (2-3 weeks before defense)

- Please complete, for our Pharm/Phys. office, the "Graduate Student Termination Form" (forwarding address, position, title, etc.)

After you have defended and all corrections have been made on your thesis, you need to submit just (1) corrected copy to Dean's Office (bond paper) single sided. Also, you will need to make (3) more single sided copies on bond paper - (1) copy for Department; (1) copy for advisor and (1) copy for yourself. Copies will be sent to Book 1 One Bookbindery where they will be bound in a hard cover with gold lettering, which the department will pay for. For graduate students-in-residence, the department will pay for two copies of thesis to be bound - one for student and one for advisor. Our department does not require a copy of student-in-residence thesis.

When a final date of exit for the student is established (usually after they have submitted their final corrected copy of thesis to the Dean) a "Graduate Student Change of Status Form" must be completed along with a graduate student 506 appt. form terminating the student and submitted to OGE.

Please contact me if you have any questions at all!