

**GRADUATE EDUCATION IN MEDICINAL CHEMISTRY  
POLICIES AND PROCEDURES MANUAL**

**A Reference Guide for Students Concerning  
Departmental Policies and Procedures**

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**Sources of Information:  
Decisions made by Faculty at Departmental Meetings  
The University of Florida Graduate Catalog  
Previous manuals prepared by College of Pharmacy Graduate Faculty**

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## Med Chem Graduate Education Manual - Students

### OVERVIEW OF GRADUATE EDUCATION IN MEDICINAL CHEMISTRY

The department admits students to a program of graduate education leading to the degree of Doctor of Philosophy (Ph.D.) in pharmaceutical sciences with a specialization in medicinal chemistry. The degree program is under the general supervision of the University of Florida Graduate School and the University of Florida College of Pharmacy, but detailed supervision and advisement are from the faculty of the Department of Medicinal Chemistry.

The objectives of the Ph.D. program are:

- (i) to provide students with a broad training in medicinal chemistry, covering organic chemistry, chemical biology, analytical chemistry, biochemistry, computational modeling, pharmacology and toxicology.
- (ii) to guide students in acquiring specialized knowledge, through an individualized program of didactic course work and laboratory research, of one particular area of medicinal chemistry.
- (iii) where possible to help graduating students find employment suited to their interests and abilities.

The department does not normally admit students to a laboratory research-based Master of Science in Pharmacy program and will only award such a degree under special circumstances. Students who have spent a minimum of two years in the program may elect to transfer to a master's program for pressing personal reasons which preclude finishing the Ph.D. program. Students whose progress in laboratory research is judged unsatisfactory for a Ph.D. degree, but who have successfully completed course requirements and some laboratory research may be required to switch to a master's degree.

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### **FUNDING OF STIPENDS, COURSES AND RESEARCH COSTS**

Students admitted to the department will be paid a stipend for teaching and/or research assistantship appointments. The amount of the base stipend is reviewed annually and is financially supported by the College and faculty advisors. Funding of students' stipends will be for a period of 4 years; however, this can be extended as the average time to completion of a Ph.D. in our department is ~5 years. Stipend support for graduate students beyond 5 years will be considered on a case-by-case basis. Exceptional students may be eligible for additional stipends from the University.

### **ADMISSION TO THE PH.D. PROGRAM**

Students who hold U.S. citizenship or permanent residency and hold bachelor's degrees in pharmacy, chemistry, or related sciences from accredited 4 year colleges in the U.S. are given priority in the selection process. The number of places available is somewhat variable, since it depends to some extent on the level of external funding of department faculty. Students are normally admitted to start in the fall semester, but can be admitted at the start of other semesters. Applications are considered by the entire faculty.

Minimum requirements for admission of U.S. citizens and permanent residents are a grade point average (GPA) of 3.0 for the last two years of undergraduate study; the Graduate Record Examination (GRE); and 3 supportive recommendations from faculty who have personal knowledge of the academic capabilities of the candidate. In the case of students who have been away from school for several years, one letter of recommendation may be from a supervisor at his or her place of employment. In addition to normal requirements, all non-US and Puerto Rican applicants must submit IELTS (International English Language Testing System), MELAB (Michigan English Language Assessment Battery) or TOEFL (Test of English as a Foreign Language) scores as part of the application process, unless they are citizens of a country where English is an official language, have spent at least one academic year as a full-time student at a college or university in

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a country where English is an official language, earned a prior bachelor's degree, master's degree or doctoral degree at an accredited university in the United States or have official proof of successfully completing the UF English Language Institute's program before applying.

Florida law requires all non-US students who are going to be graduate teaching assistants — even if exempted from the IELTS, MELAB and TOEFL requirement — to prove adequate command of the English language. Before getting a graduate teaching assistantship, they must submit TSE (Test of Spoken English) or SPEAK (Speaking Proficiency English Assessment Kit) scores that meet the required minimums. Students who are only involved in grading papers do not have to pass the TSE or SPEAK test.

The minimum TOEFL score for admission to UF is 80. In order to qualify for TA duties, a TOEFL speaking score of 23, or higher, is required.

Successful candidates will be informed of their acceptance into the program in writing, with a letter directly from the graduate coordinator, and asked to inform the department of their intention to take up this offer in writing by the University deadline in April or within 3 weeks. The Office of Graduate Programs will coordinate the admissions process with guidance from the department graduate coordinator and in accordance of UF Office of Admissions, International Center, and Graduate School policies.

### **ROLE OF THE GRADUATE COORDINATOR**

The graduate coordinator or designee will review admission materials and ensure that requests for information are sent in a timely manner. Department personnel will contact prospective qualified students by telephone if they are in the U.S. and will advise the department faculty as to when the faculty should meet to select students for admission. The graduate coordinator will act as advisor for incoming students in their first semester, if they have not yet selected a mentor. The graduate coordinator will meet with all new students during their first month and ensure that students understand

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what is expected of them. He or she will oversee the process of selection of an advisor, if the new student does not yet have an advisor. If the student does not have an advisor, the graduate coordinator will assist them with course selection. The graduate coordinator will review grades of each student at the end of each semester and ensure that if any student has a GPA of  $< 3.0$ , the student and his/her advisor are notified that he or she is on probation. The graduate coordinator will serve as a contact in the department concerning policies and procedures relating to graduate education. The graduate coordinator and faculty will recommend teaching assistant duties for students to the graduate studies committee (see Teaching Responsibilities).

### **FELLOWSHIPS**

Students are encouraged to apply for national and graduate school fellowships and awards. Fellowships can be utilized to pay stipends or to supplement departmental stipends up to an additional \$5000 and for research and appropriate travel expenses. Students awarded fellowships may have additional requirements and should reference guidelines to the particular award.

### **VACATIONS**

Graduate students are permitted two weeks vacation per calendar year to be taken at a time mutually agreed to by the student and his/her major advisor. **Students should recognize that time taken during semester breaks is included in the two weeks vacation period.** In addition, graduate students are granted the following usual state holidays: New Year's Day; Martin Luther King Day; Memorial Day; Independence Day; Labor Day; Veterans Day; Thanksgiving Day and the day after Thanksgiving; Christmas Day. Students may also take designated University holidays.

Financial support may be terminated for unexcused absences.

### **SELECTION OF A MAJOR ADVISOR AND SUPERVISORY COMMITTEE**

#### Major Advisor

In many cases, students will join the department already committed to a particular major

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advisor. If a student is accepted without pre-selecting a major advisor, then following admission to the department, that student must select an advisor by the end of their first semester in the program.

### Changing Major Advisor

Changing a research advisor is very costly to both the student and faculty member involved. Research programs are not transferable from one advisor to another, time is wasted and the student must recall that their time in the graduate program comes at a financial investment. However, if the move is deemed necessary, the following protocol should be followed.

1. The student must first discuss the change with his/her advisor.
2. The student and faculty member should both submit a letter of explanation to the department. The faculty member's letter should contain an overall evaluation and appraisal of the situation.
3. The department chair will evaluate the letters and discuss them with both individuals. The chair will then make a decision concerning the requested change.
4. All notebooks and pertinent papers must be left with the initial advisor unless permission to transfer them is obtained from the initial advisor.

### Supervisory Committee

Students are encouraged to establish their committee near the end of their first year in the graduate program, but must have three of the four committee members identified by the midpoint of the 5<sup>th</sup> semester. The composition of this committee must be on file with the department and the Graduate School. The composition of the committee should reflect the anticipated research project. At least two other members of the committee (apart from the major advisor) must be from the Department of Medicinal Chemistry (minimum of three Med Chem faculty on each supervisory committee). There should be no more than 2 other faculty from any other single department. One member of the committee should be designated the "external member," in accordance with Graduate School policies. This person

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should represent a discipline which is **not** the major discipline of the Ph.D. The supervisory committee should be selected by the committee chair in conjunction with the student. The composition of the committee must be approved by the department chairperson and the Associate Dean for Research and Graduate Education of the College of Pharmacy, and will be formally appointed by the Dean of the Graduate School.

Although a full committee must be present for the exam, if one committee member can not attend the exam, a suitable substitution may be utilized except for the external member. Only the chair and student must be present in the same location as the Graduate School allows other committee members to join remotely.

Students are required to meet with their Supervisory Committee on an annual basis starting in year two of the PhD program (note: the first committee meeting will have to be done by the spring semester of year 2 or they will not be allowed to register for summer courses). The goal of these meetings are to review progress and provide feedback and comments to the student. Some students will meet with their committee more frequently, at the request of the student, or as determined by the Chair, Committee or Department Chair. All committee meetings will be documented with signed forms (the student and all committee members will sign a form with information as to progress and advice for future work) and dates will be recorded with Graduate Programs for tracking of annual meetings. Students are required to send an updated CV to committee members before all committee meetings (and prelim/final defense meetings), so the committee can review progress (courses taken, GPA, publications, awards) and make recommendations. Examples of CVs can be seen on faculty pages and advisors are encouraged to provide feedback to students before CV's are distributed.

#### Chair and Co-Chair

In unusual cases, doctoral research may require the guidance of a specialist in an area of study other than that of the supervisory committee chair. In such cases, the department chair may

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recommend appointment of a co-chair who is on the doctoral faculty. In rare cases where a co-advisor is from another department, the Graduate Coordinator of Medicinal Chemistry will serve on the committee.

#### Other Members of the Supervisory Committee

Courtesy faculty and faculty not appointed to the Graduate Faculty shall not be included on the official supervisory committee; however, they are allowed to attend final exams if deemed appropriate.

#### Duties of the Supervisory Committee

1. To inform the student of all regulations governing the Ph.D. degree. This does not absolve the student from the responsibility of becoming informed of these regulations.
2. To meet immediately after appointment to review the student's qualifications, his/her planned program of study, and his or her proposed dissertation research project.
3. To conduct the qualifying examination.
4. The Supervisory committee is required to meet with the student at least once a year to evaluate the student's progress. Some students will be required to meet with their committee more frequently than once a year (every 3 or 6 months).
5. To conduct the final oral examination. No fewer than four faculty members including the supervisory committee shall be present. The four faculty shall be graduate faculty and full time tenure track.

#### **MEDICINAL CHEMISTRY COURSE REQUIREMENTS FOR PH.D. STUDENTS**

The required courses are listed below. The remainder of the 90 credit hours are to be settled on by the student and his/her supervisor. A minimum of six 3-credit courses are expected. **IF STUDENTS TAKE COURSES AT 4000 LEVEL OR BELOW, THESE WILL NOT COUNT**

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**TOWARDS THE CREDITS NEEDED FOR THE Ph.D. DEGREE.** Also, courses in the Pharm.

D. curriculum do not count towards the departmental core course requirements. Incoming students with a Master's degree may be able to transfer or have recognized up to 30 credits from previous graduate level didactic courses, upon approval by the graduate faculty in Medicinal Chemistry. All students must have their course selection approved in writing by their major advisor (or the graduate coordinator in the first semester), using the course registration form.

**Medicinal Chemistry.**

Students must take the following two drug design courses taught by all departmental faculty.

PHA 6447. Drug Design I (3 credits, Fall)

PHA 6935. Drug Design II (3 credits, Spring)

PHA 6934. Seminar in Medicinal Chemistry (1 credit)

PHA 7939. Journal Club (1 credit)

The journal club (during years 1-3 of grad study)/seminar (years 4 and beyond) **must** be attended by **all** students during the time they are in the department, and they must make presentations as requested. In their final year, students will be required to present their thesis research at a departmental seminar. Students should register for seminar credit during the semesters they present.

Students must take at least two, or 6 credit hours, of the following five didactic courses, which are offered by department faculty.

PHA 6425. Drug Biotransformation and Molecular Mechanisms of Toxicity (3 credits)

PHA 6356. Structure Determination of Complex Natural Products (3 credits;  
prerequisite: CHM 5235, or similar course with approval)

PHA/CHM 6435. Biosynthetic Logic of Medicinal Natural Products (3 credits)

PHA 6472. Organic Synthesis of Drug Molecules (3 credits)

PHA 6935. Molecular Imaging (1 credit)

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PHA 6935. Selected Topics in Medicinal Chemistry (1-3 credits)

Other course numbers listed in the graduate catalog are for reading courses (PHA 6936), which may be offered as needed by any faculty, and for laboratory research projects (PHA 6905C, 6910 up to 5 credits) or thesis and dissertation research (PHA 6971, Research for Master's Thesis; PHA 7979, Advanced Research; PHA 7980, Doctoral Research). The course PHA 6905C, Research Procedures in Medicinal Chemistry, normally takes the form of a literature review in a specialized area of medicinal chemistry, combined with related laboratory research. This course requires a written exam or paper and may be taken for a letter grade of 1 to 4 credits per semester, up to a maximum of 12 credits. PHA 6905C may not be taken while a student is on probation.

In addition, graduate students will take Introduction to Graduate Studies (PHA 6894, 1 credit) during their first academic year in our program. During the first summer, graduate students will take Life Cycle of a Drug (PHA 6935, 1 credit). During the second summer in our program, graduate students will take Special Topics: Grant Writing (PHA 6936, 1 credit).

Other appropriate courses may be offered by the Chemistry Department, Pharmaceutics Department, Biochemistry Department, Statistics Department or other departments according to the program of the individual student. It is also recommended that students take an advanced statistics course such as STA 6116 and a course on responsible conduct of biomedical research, such as GMS 7877 (1 credit).

### **Chemistry.**

Graduate students may take the following courses as electives from the Chemistry Department (taught every year). Other courses can be considered based on a student's interests and graduate research.

CHM 5224. Basic Principles of Organic Chemistry (3 credits)

CHM 5235. Organic Spectroscopy (3 credits)

CHM 6036. Chemical Biology (3 credits)

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CHM 6225. Advanced Principles of Organic Chemistry (4 credits)

CHM 6226. Advanced Synthetic Organic Chemistry (3 credits)

#### **Biochemistry.**

Students with no previous upper-level coursework in Biochemistry must take one or more of the following courses.

BCH 4024. Introduction to Biochemistry and Molecular Biology (4 credits; Note: this course will not count towards the Ph.D., but may correct deficits in undergraduate education).

BCH 5413. Eukaryotic Molecular Biology and Genetics (3 credits)

BCH 6206. Advanced Metabolism (3 credits)

BCH 6415. Advanced Molecular and Cell Biology (3 credits)

BCH 6740. Advanced Physical Biochemistry (3 credits)

#### **Pharmacology.**

Students with no previous upper-level coursework in Pharmacology have the option to take one course in Pharmacology (GMS 6009, Principles of Drug Action is an example), since an understanding of basic pharmacological principles is fundamental to modern Medicinal Chemistry. Several courses are available.

### **INTERDISCIPLINARY TOXICOLOGY PROGRAM**

The Department of Medicinal Chemistry also participates in the University-wide Interdisciplinary graduate program in Toxicology. Students wishing to specialize in Medicinal Chemistry with a sub-concentration in Toxicology must, in addition to departmental requirements take the following Toxicology courses:

VME 6602. General Toxicology (3 credits)

VME 6603. Advanced Toxicology (3 credits)

Along with one of the following three electives:

GMS 7593. Functional Genomic Applications in Pharmacology and Toxicology (2 credits)

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VME 6606. Aquatic Toxicology and Ecological Risk Assessment (3 credits)

VME 6607. Human Health Risk Assessment (4 credits)

One of the departmental courses taken by toxicology students must be PHA 6425. Students interested in toxicology must take an advanced Statistics course such as STA 6116.

### **STUDENT RECORDS**

All application material, correspondence, copies of transcripts, grade sheets and other pertinent materials will be kept in a file to be maintained in the department. This material is confidential and will only be available to the graduate coordinator, the department chair, members of the supervisory committee and the graduate dean. Most of this information will also be held in the Office of Graduate Programs and this information is held in a digital system.

### **ACADEMIC PROGRESS**

Students are required to maintain a GPA of at least 3.0 to stay in the graduate program. Passing grades for graduate students are A, A-, B+, B, B-, C+, C and S. At the end of every semester, each student is responsible for providing a copy of his/her grades from that semester to the graduate coordinator and major advisor for review. The policy on grades below a B in a required course is as follows: D, D+ and C- must be repeated. On receiving a C, C+ or B- in a required graduate course, the faculty has the option of requiring the student to repeat the course. While the decision is a Departmental one, it will depend heavily on the advice of the student's immediate advisor. It is the primary responsibility of the major advisor to assure quality performance by his/her student. It is the responsibility of the major advisor to document, in writing, unacceptable performance by a student. This documentation should be placed in the student's file. Each year, a written evaluation of each student's progress must be made by the major advisor, countersigned by the student, and placed in the student's record.

### **PROBATION**

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A student whose GPA falls below 3.0 will be allowed one semester on probation to make up the deficit. For students on probation, the Department will assume the tuition fee waiver only once in the course of the student's matriculation. The course PHA 6905C may not be taken during the semester a student is on academic probation. Students who fail to raise their GPA above 3.0 by the end of the semester that they are on probation will normally be required to leave the program. Under exceptional circumstances, students may request a further extension. This request will be reviewed by the major advisor and the graduate coordinator, and if a further extension is recommended this must be approved by the department chair and the Dean of the Graduate School.

### **TEACHING RESPONSIBILITIES**

Every student supported by the college must assist in grading or teaching courses in medicinal chemistry to professional pharmacy students. The graduate coordinator, in consultation with the faculty teaching the course, will recommend TA duties to the Associate Dean of Graduate Education, who will make the assignment. Students who are assigned duties as a teaching assistant will then report to the faculty member(s) in charge of the course. All teaching assistants will be evaluated for their performance at the end of the assignment.

### **QUALIFYING EXAMINATION**

Students are required to take the qualifying exam during the Fall semester of their 3<sup>rd</sup> year in the Medicinal Chemistry graduate program. All members of the student's Committee must be present for the qualifying examination, either in person or virtually. The qualifying exam will include the preparation and oral presentation of two separate proposal documents, which include: (1.) one research proposal regarding the student's graduate work, and (2.) one literature based research proposal focused on a topic in Medicinal Chemistry that does not directly overlap with the student's graduate project. Each of these required proposals has specified guidelines (below) and both proposals are required to be submitted to the student's committee at least 14 days before the scheduled

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exam.

The research proposal regarding the student's graduate work should contain key preliminary results and proposed future studies – in essence, this document should be an updated document prepared from the grant writing course (PHA 6396: Grant Writing) students take during their second summer in our program. As such, the guidelines should follow that of a National Institutes of Health (NIH) R21/F31 grant that would be submitted for funding, as required in the grant writing course. Students should prepare a 30 minute presentation regarding the proposal that is focused on their graduate work and expect to answer questions directly or indirectly related to the proposal from committee members throughout.

The literature based research proposal should be independently developed by the student and based on a recent paper from the literature. The student is required to present the paper to their committee to gain approval as a topic for their literature based proposal, then will give a 20 minute Journal Club presentation on this topic early in the fall semester of his/her 3<sup>rd</sup> year in our program. Therefore, students are required to coordinate their approved paper with the seminar coordinator. In addition to the presentation of the Journal Club course, students should prepare an additional 10 minute presentation regarding their literature based proposal as part of the qualifying exam (with minimal background info since the committee will have seen the selected paper in a departmental seminar when presented by the student), and expect to answer questions from committee members throughout the presentation.

Both proposals should have the same format and be consistent with the NIH requirements for an R21/F31 grant application. Each proposal should include the following items and adhere to the specified guidelines (including page limit requirements): (1) title page (1 page limit), (2) specific aims page (1 page limit), (3) research strategy (6 page limit; figures/schemes should be included), (4) literature references (no page limit, please use ACS style for references). Regarding fonts, be sure to

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use Arial 11 or Times New Roman 12 throughout each proposal. In addition, narrow (0.5 inch) margins, and either 1.0 or 1.15 line spacing should be used throughout each proposal. The student is requested to strictly follow the specified guidelines, or he/she will need to revise the proposal(s) which could delay the qualifying exam.

Following the qualifying presentation by the student, the Committee will collectively discuss, evaluate and provide the student with either a pass, or failing qualifying exam performance. A student must pass the oral qualifying exam before being formally admitted as a candidate for the PhD degree. If recommended by the Committee, a student failing the oral exam will be permitted to retake the exam at a later date determined by the Committee. A maximum of two oral examinations will be allowed, failure to pass the second oral exam disqualifies a student from advancing to doctoral candidacy status.

Students are required to provide an updated CV (with academic background, courses taken in the graduate program, overall GPA in the graduate program, all publications, etc.) to their committee before the oral exam and should schedule the qualifying exam for three hours.

#### Time Lapse

Between the successful completion of the qualifying examination and the date of the degree, there must be a minimum of two semesters. The semester in which the qualifying examination is passed is counted provided that the examination occurs before the midpoint of the term.

#### Time Limitation

All work for the doctor's degree must be completed within five calendar years after the qualifying examination, or this examination must be repeated.

### **ADMISSION TO CANDIDACY**

Formal admission to candidacy is that time when the graduate student becomes an actual

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candidate for the Ph.D. degree. Such admission requires approval of the student's supervisory committee, the chair of his or her department, the College Dean and the Dean of the Graduate School. Approval is based on (1) academic record, (2) the opinion of his or her supervisory committee concerning his or her overall fitness for candidacy, (3) an approved dissertation topic, and (4) successful performance of the qualifying examination.

### **DISSERTATION**

Every candidate for a doctoral degree is required to prepare and present a dissertation that shows independent investigation and is acceptable in form and content to his or her supervisory committee and to the Graduate School. Since all doctoral dissertations will be published on the Internet, it is necessary that the work be of publishable quality and that it be in a form suitable for publication. Dissertations should be prepared in the format specified by the Graduate School. It is recommended that all students (1) view final dissertations from other lab members who have previously graduated with a PhD from our program and (2) schedule one, or more, meeting(s) with the thesis editor during the writing of the dissertation to discuss formatting details.

#### Publication of Dissertation

All candidates for the Ph.D. degree are required to sign an agreement regarding electronic publication.

#### Copyright

The candidate may, for a charge, choose to copyright the dissertation. To assure receipt of the valuable Copyright Registration Certificate, the candidate must give a permanent address through which he/she can always be reached.

### **FINAL EXAMINATION**

After first submission of the dissertation to the Graduate School and completion of all other work for the degree, and in no case earlier than six months before the conferring of the degree, the

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candidate will be given a final examination, oral or written or both, by the supervisory committee. Final dissertations should be provided to the Supervisory Committee two weeks/14 days before the final defense to ensure adequate review. Final exams should be scheduled for three hours by the student.

#### Announcement of Final Examination

Students must inform Graduate Programs via email at least three weeks prior to the defense date so they can provide the required paperwork and distribute the announcement to the College. All paperwork will be submitted to the Graduate School to notify them of the student's status after the exam has been completed. An announcement of the examination must be sent to faculty members in the College of Pharmacy including the supervisory committee, inviting them to attend.

#### Members Required at the Examination

At least four faculty members must be present at the oral portion of the final examination. This includes all supervisory committee members. At the oral examination the candidate will present a 45 minute open seminar to the department and other interested persons on his or her dissertation research, and answer questions from the floor. The examination will then be closed for further questioning by the committee and other faculty members, as appropriate.

#### Signatures

Assuming the candidate is successful, then the Final Examination Report shall be signed by the all members of the Supervisory Committee. The signed Final Examination Report will be submitted electronically to the Graduate School after the dissertation has been corrected and all signatures obtained.

#### Certification

Doctoral candidates who have completed all requirements for the degree, including satisfactory defense and final acceptance of the dissertation, may request certification to that effect

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prior to the receipt of the degree. The Office of Graduate Programs can provide a formal letter before the degree is conferred to serve as verification to a future employer. Requests for this letter should be sent to the Office of Graduate Programs via email.

#### **SUMMARY OF SUGGESTED TIMETABLE FOR THE PH.D. STUDENT**

- Year one      First semester: Drug Design I & other coursework as decided by student and graduate coordinator; interview faculty; select major advisor (if not selected upon admission).  
Second semester: Drug Design II & other course work; start laboratory research, form supervisory committee. Third semester: course work (Intro to Grad Studies & Lifecycle of a Drug); research
- Year two      Complete course work and continue research; First Committee Meeting (by the end of Spring Semester); Summer: Grant Writing course
- Year three      Research; Qualifying exam (Fall Semester)
- Year four      Research; Committee Meeting (critical review of progress, including primary data)
- Year five      Writing dissertation, preparing for final examination, considering employment options

#### **SPECIFIC REQUIREMENTS FOR THE MASTER OF SCIENCE IN PHARMACY/WITH A SPECIALIZATION IN MEDICINAL CHEMISTRY**

##### Thesis Master's Degree Requirements

Unless otherwise specified, for any master's degree, the student must earn a minimum of 30 credits including no less than 24 credits of regular course work and up to 6 credits in thesis research as a graduate student at the University of Florida, of which no more than 9 semester hours of graduate level course work earned with a grade of A, A-, B+ or B may be transferred from institutions approved by the Dean of the Graduate School.

##### Major

At least 50% of the minimum course work, exclusive of 6971, for a master's degree must be in courses open only for graduate credit (5000 and above) in a field of study designated the major.

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If a minor is chosen, at least 6 credits of work are required; two 6-credit minors may be taken. Minor work must be in a department other than the major. A student does not have to select a minor, but the non-major course work must be taken outside the major department and must be 3000 level or above.

### Credits and Grades

The student must have a minimum 3.00 GPA for all course work attempted for the degree, and as well, a minimum 3.00 GPA for course work in the major. See Academic Progress (section) for additional information.

### Thesis

The candidate is required to prepare and present a thesis acceptable to his/her supervisory committee and the Graduate School. He/she should consult the Graduate School for instructions concerning the form of the thesis and the date when the thesis is to be submitted to the Graduate School.

### Supervisory Committee for the Master of Science in Pharmacy

At least two members selected from the Graduate Faculty must be on the supervisory committee. These members are recommended by the student's department chair, approved by the College Dean, and appointed by the Dean of the Graduate School. The Dean of the Graduate School is an ex-officio member of all supervisory committees. If a minor is designated, it should be represented by one member on the committee. The committee should be appointed as soon as possible, and no later than the end of the second semester.

Only members of the Graduate Faculty can be listed officially on the supervisory committee. Names of courtesy faculty, regular faculty, and others not on the Graduate Faculty may not appear on the student's official supervisory committee.

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At least three faculty members must be present at the student's final examination, but only members of the official supervisory committee are required to sign the thesis and the report of the final examination.

#### Admission to Candidacy

Admission to candidacy is no longer required for students pursuing master's degrees.

#### Final Examination

The Master's thesis defense final exam has the same process as the dissertation defense final exam for the Ph.D.

#### Time Limitation for Completion of the Master of Science in Pharmacy

All work (including transfer credit) counted toward the M.S. degree must be completed during the seven years immediately preceding the date on which the degree is to be awarded.

### **NON-THESIS MASTERS DEGREE REQUIREMENTS**

For a non-thesis Master's degree, students must take 30 hours didactic course work (this may include up to 5 credits PHA 6910, up to 3 credits of PHA 6934), of which 9 hours may be transferred from another program.

### **MINOR IN MEDICINAL CHEMISTRY REQUIREMENTS**

Students from other departments or colleges who wish to take a minor in Medicinal Chemistry must take, at a minimum, six didactic credit hours of courses in Medicinal Chemistry, of which three credits must be PHA 6447, Drug Design I. The student should have a member of the Medicinal Chemistry graduate faculty on their supervisory committee. The student should either make a presentation at the departmental seminar at least once, or take a third Medicinal Chemistry course.