

## Appendix C. Degree Requirements

### GRADUATE PROGRAM IN PHARMACEUTICAL CHEMISTRY M.S. DEGREE REQUIREMENTS

Graduate Council Approval: June 11, 2012

#### Master's Degree Requirements

##### 1) Admission requirements:

Consideration for program admission requires a bachelor's degree, three letters of recommendation, official transcripts, GRE scores, TOEFL or IELTS score (if applicable), and an Office of Graduate Studies online application with fee by the stated admission deadline. A minimum undergraduate GPA of 3.0 is required. However, admissions decisions are made on a case-by case basis. Meeting some or all of these criteria does not guarantee admission, but merely eligibility. The decision to recommend admission to the Dean of Graduate Studies will be made by the Program Admissions Committee on the basis of available space and the competitiveness of applicants compared to the eligible pool.

Applicants are strongly encouraged to communicate with potential research advisors (major professors) prior to admission to the program. It is essential that prospective students contact faculty in the Chemistry Graduate Program (<http://www.chem.ucdavis.edu/faculty/cf-alphabetical.php>) whose laboratories are conducting research in areas of research relevant to Pharmaceutical Chemistry that the student wishes to pursue, in order to introduce themselves and inquire about faculty willingness to accept a new student in this degree program. This process of communicating with potential major professors should begin in the Fall, prior to the relevant applications deadline. Applicants should take the initiative to inquire about future research directions of laboratories, exchange research ideas with potential major professors, and make every effort to identify viable possibilities. While formal acceptance into a research group cannot occur prior to admission, contacts should be far-enough developed such that at least tentative identification of a research advisor can be made as soon after the time of admission as possible.

##### a) Prerequisites:

In addition to the admission requirements stated above, applicants are expected to have the equivalent of the following UC Davis courses:

##### Preparatory subject matter

CHE 2A/B/C	General Chemistry	15 units with lab
BIS 2A/B or C	Biological Sciences	9 units with lab
PHY 7A/B/C	General Physics	12 units with lab
MAT 16A/B/C	Calculus	9 units
STA 13	Statistics	4 units

##### Depth subject matter

CHE 128A/B/C and 129A/B/C (if two or more sequences are offered, the more rigorous option is strongly encouraged)	Organic Chemistry	15 units with lab
CHE 107A/B	Physical Chemistry	6 units
BIS 102	Biochemistry	3 units

Undergraduate coursework in organic synthesis (CHE 131, 3 units) and participation in undergraduate research in chemistry are not required for admission but are certainly desirable and may strengthen a prospective student's application to the program.

**b) Deficiencies:**

Course work deficiencies should be made up by the end of the first academic year following initial enrollment by earning a letter grade of "B" or better.

**2) M.S. Plan I (Thesis):**

**Plan I:** This plan requires a minimum of 30 units of upper division (100 series) and graduate (200 series) courses and, in addition, a research-based thesis. At least 12 of the units must be graduate work in the major field. The 9-unit Pharmaceutical Chemistry sequence of CHE 130A/B and CHE 135 must be completed if equivalent courses have not been completed prior to enrollment.

**3) Course Requirements – Core and Electives (52 units):**

This program is a *research-based* degree program, a Type I (Thesis) Plan Masters program. It *cannot* be completed by examination or by coursework alone.

**a) Core Courses (48 units):**

CHE 231A	Organic Synthesis: Methods and Strategies	4 units
CHE 233	Physical-Organic Chemistry	3 units
CHE 263	Introduction to Research Methodology	9 units
CHE 296	Research in Pharmaceutical Chemistry (letter graded)	18 units
CHE 299*	Research (three quarters minimum)	14 units

\*Up to 6 units may be fulfilled in part by internships at domestic and international research facilities with the advance approval of the major professor and the graduate advisor.

Courses CHE 231A and 233 must be completed during the first year of enrollment in the program as a condition for satisfactory progress.

If equivalent courses have not been completed prior to enrollment (which is likely), the following are also required to be completed during the first year:

CHE 130A/B	Pharmaceutical Chemistry I & II	6 units
CHE 135	Advanced Bio-organic Chemistry Laboratory	3 units

**b) Elective Courses:**

CHE 131	Organic Synthesis	3 units
CHE 219/L	Spectroscopy of Organic Compounds	5 units w/lab
CHE 231B	Advanced Organic Synthesis	3 units
CHE 261	Current Topics in Chemical Research	2 units
CHE 290	Seminar	2 units
CHE 295	Careers in Chemistry	1 unit

**c) Summary:** 48 units of core coursework are required, although many students will be required to take CHE 130A/B and 135 for an additional 9 units. Full-time students must enroll for 12 units per quarter including research, academic and seminar units. Courses that fulfill any of the program course requirements may not be taken S/U unless the course is normally graded S/U. Once course requirements are completed, upon the advice of their major professor the student can take additional classes in appropriate disciplines and at suitable levels (e.g., 100 and 200 series classes) as needed, although the 12 units per quarter are generally fulfilled with a research class (299) and perhaps seminars. Per UC regulations students cannot enroll in more than 12 units of graduate level courses (200) or more than 16 units of combined undergraduate and graduate level (100, 200, 300) courses per quarter.

#### 4) Special Requirements:

N/A

#### 5) Committees:

**a) Admission Committee:** Once the completed application, all supporting material, and the application fee have been received, the application will be submitted to the Admissions Committee. The Admissions Committee consists of 11 graduate program faculty and one graduate student. Based on a review of the entire application, a recommendation is made to accept or decline an applicant's request for admission. That recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will be sent by Graduate Studies. Applications are accepted until May 31 although for full consideration students are encouraged to submit their applications prior to Dec 15 for the subsequent Fall's entering class.

**b) Graduate Affairs Committee:** The Graduate Affairs Committee consists of eight faculty members representing the diverse research disciplines in the Chemistry Graduate Program, and the Graduate Student Affairs Officer. Its members serve as the graduate student advising body for the group and together with the student's major professor will assist the student in developing his/her study plan. Normally the plan will be devised and submitted at the start of the student's first quarter in the program.

**c) Thesis Committee:** During his/her first quarter in the program, the student, in consultation with his/her major professor and graduate advisor, should select three faculty (including the major professor) to serve as a Guidance Committee. The student will normally advance to candidacy during his/her fourth quarter in the program. At that point Thesis Committee nominations will be submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy. The members of the Guidance Committee may also serve as the student's Thesis Committee. The major professor serves as Chair of both the Guidance and Thesis Committees. The responsibility of this committee is to assist in the guidance of the student and to read and approve the thesis. The thesis must be prepared in accordance with Graduate Studies guidelines. The Program requires three paper copies of the thesis and one original signed signature page.

**6) Advising Structure and Mentoring:** The **Major Professor** is the faculty member who supervises the student's research and thesis; this person serves as the Chair of the both the Guidance and Thesis Committees. The **Graduate Advisor**, who is appointed by Graduate

Studies and is a member of the Graduate Affairs Committee, is a resource for information on academic requirements, policies and procedures, and registration information. The **Graduate Student Affairs Officer** assists students with identifying appointments and general university policies. The **Mentoring Guidelines** can be found in current edition of the Chemistry Graduate Program Handbook, available in the office of the Graduate Student Affairs Officer, or on the web at <http://gradstudies.ucdavis.edu/gradcouncil/mentoring.pdf>.

**7) Advancement to Candidacy:** Every student must file an official application for Candidacy for the Degree of Master of Science after completing one-half of their course requirements and at least one quarter before completing all degree requirements; this is typically the fourth quarter. The Candidacy for the Degree of Master form can be found online at: <http://www.gradstudies.ucdavis.edu/forms/>. The application must be routed through the Chemistry Graduate Student Affairs Officer for the approval of the Graduate Advisor and then filed with Graduate Studies. A completed form includes a list of courses the student will take to complete degree requirements. If changes must be made to the student's course plan after s/he has advanced to candidacy, the Graduate Advisor must recommend these changes to Graduate Studies. Students must have their Graduate Advisor and committee Chair sign the candidacy form before it can be submitted to Graduate Studies. If the candidacy is approved, the Office of Graduate Studies will send a copy to: the appropriate graduate staff person and the student; the Thesis Committee Chair will also receive a copy, if applicable. If the Office of Graduate Studies determines that a student is not eligible for advancement, the department and the student will be told the reasons for the application's deferral. Some reasons for deferring an application include: grade point average below 3.0, outstanding "I" grades in required courses, or insufficient units.

**8) Thesis Requirements:**

Guidance and thesis committee meetings: The candidate and major professor should meet at least once a year with the other members of the guidance or thesis committee to discuss progress and any changes in research objectives.

Thesis: Research for the Master's thesis is to be carried out under the supervision of a faculty member of the program. The thesis research must be conducted while the student is enrolled in the program. The Masters thesis must demonstrate the student's proficiency in research methods and scientific analysis, and a thorough knowledge of the state-of-the-art of the field. Original contributions to knowledge are encouraged, but not necessarily expected, at the M.S. degree level. However, consistent with expectations in the fields of relevance, the thesis should consist of either (1) an original research contribution of limited scope or (2) an advance in the state-of-the-art of an established research area. The thesis is submitted to the thesis committee at least one month before the student plans to make requested revisions. All committee members must approve the thesis and sign the title page before the thesis is submitted to Graduate Studies for final approval. Should the committee determine that the thesis is unacceptable, even with substantial revisions, the program may recommend the student for disqualification from the program to the Dean of Graduate Studies.

The thesis must be filed in a quarter in which the student is registered or on filing fee. Instructions on preparation of the thesis and a schedule of dates for filing the thesis in final form are available from Graduate Studies; the dates are also printed in the UC Davis General Catalog and in the Class Schedule and Registration Guide issued each quarter. A student must have a GPA of 3.0 for the M.S. degree to be awarded.

**9) Normative Time to Degree:** Completion of all requirements for the M.S. degree would be expected to require six quarters—four quarters Normative Time to Advancement to Candidacy and two quarters Normative Time in Candidacy.

**10) Typical Time Line and Sequence of Events:**

**Sample First-year Study Plan**

<b>Fall Quarter</b>	<b>Winter Quarter</b>	<b>Spring Quarter</b>
<u>Required:</u> Phys-Org CHE 233 (3 units) Method CHE 263 (3 units) Research CHE 299 (3-6 units)	<u>Required:</u> Synthesis CHE 231A (4 units) Res Method CHE 263 (3 units) Research CHE 299 (3-5 units)	<u>Required:</u> Res Method CHE 263 (3 units) Research CHE 299 (4-9 units)
<u>Sample Electives:</u> Curr Topics CHE 261 (2 units) Seminar CHE 290 (2 units) Chem Careers CHE 295 (1 unit)	<u>Sample Elective:</u> Curr Topics CHE 261 (2 units) Seminar CHE 290 (2 units)	<u>Sample Elective:</u> Curr Topics CHE 261 (2 units) Seminar CHE 231B (3 units) Seminar CHE 290 (2 units)
Synthesis CHE 131 (3 units)		

**Sample Second-year Study Plan**

<b>Fall Quarter</b>	<b>Winter Quarter</b>	<b>Spring Quarter</b>
<u>Required:</u> Research CHE 296 (6 units) Research CHE 299 (3-6 units)	<u>Required:</u> Research CHE 296 (6 units) Research CHE 299 (1-6 units)	<u>Required:</u> Research CHE 296 (6 units) Research CHE 299 (1-6 units)
<u>Sample Electives:</u> Curr Topics CHE 261 (2 units) Res Method CHE 263 (3 units) Seminar CHE 290 (2 units) Chem Careers CHE 295 (1 unit)	<u>Sample Electives:</u> Curr Topics CHE 261 (2 units) Res Method CHE 263 (3 units) Seminar CHE 290 (2 units) Spectroscopy CHE 219/L (5 units) Drug Discovery PHA 207 (3 units)	<u>Sample Electives:</u> Curr Topics CHE 261 (2 units) Res Method CHE 263 (3 units) Seminar CHE 290 (2 units) Adv Synth CHE 231B (3 units)

Students who are required to complete CHE 130A/B and CHE 135 would add CHE 130A in the Winter quarter of the first year and CHE 130B and CHE 135 in Spring quarter. The First-year Sample Schedule below illustrates these changes. Year 2 remains unchanged.

**Sample First-year Schedule**

<b>Fall Quarter</b>	<b>Winter Quarter</b>	<b>Spring Quarter</b>
<u>Required:</u> Phys-Org CHE 233 (3 units) Res Method CHE 263 (3 units)	<u>Required:</u> Pharm Chem CHE 130A (3 units) Synthesis CHE 231A (4 units)	<u>Required:</u> Pharm Chem CHE 130B (3 units) Adv Bio-org Lab CHE 135 (3 units)

Research CHE 299 (3-6 units)

Res Method CHE 263 (3 units)

Res Method CHE 263 (3 units)

Research CHE 299 (3-5 units)

Research CHE 299 (3-7 units)

Sample Electives:

Curr Topics CHE 261 (2 units)

Seminar CHE 290 (2 units)

Chem Careers CHE 295 (1 unit)

Synthesis CHE 131 (3 units)

Sample Electives:

Curr Topics CHE 261 (2 units)

Seminar CHE 290 (2 units)

Sample Electives:

Curr Topics CHE 261 (2 units)

Seminar CHE 290 (2 units)

Other possible electives may include graduate special topics courses in biological and organic chemistry.

**11) Sources of funding:** Students are not guaranteed financial support in this program. As circumstances permit students may receive support in the form of GSR funds from their major professor or teaching assistant positions in the Department.

**12) PELP, In Absentia, and Filing Fee status.**

Information about PELP (Planned Educational Leave), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found in the Graduate Student Guide: <http://www.gradstudies.ucdavis.edu/publications/>.

Planned Educational Leave (PELP) applications must be routed through the Graduate Student Affairs Officer for approval by the Graduate Affairs Committee. Students may not be on PELP status for more than three academic quarters. In the event that a PELP expires, it will be necessary to file a readmission application.

Students are eligible for filing fee status after completing their coursework and a working draft of their thesis. In order to be approved for filing fee status, a student must submit the filing fee request along with signatures of at least two members of the Thesis Committee stating that they have received an acceptable working draft of the thesis. See the Graduate Adviser's Handbook for application procedure details and eligibility limitations: <http://www.gradstudies.ucdavis.edu/publications/>. The application must be routed through the Graduate Student Affairs Officer for approval by the Graduate Affairs Committee and then must be filed with Graduate Studies. Filing Fee is available for one quarter only, but extensions may be approved on a case-by-case basis. In the event that filing fee status expires, the student must file an application for readmission.

UNIVERSITY OF CALIFORNIA, DAVIS  
 Department of Chemistry  
 MS Degree Program in Pharmaceutical Chemistry  
 Master of Science Program of Study

Student Name: \_\_\_\_\_ Quarter of Completion: \_\_\_\_\_

Chemistry Graduate courses taken in the B.S. program (not to be listed in items 1-4).

Course Dept. & Number	Quarter Completed	Grade	Units

1. Chemistry Graduate Courses – at least 3 units (excluding 29X seminar series and 299).

Course Dept. & Number	Quarter Completed	Grade	Units
CHE 233	Fall		
		Total	

2. Research (296) – 18 units; (299) – at most 12 units.

Course Dept. & Number	Quarter Completed	Grade	Units
CHE 296	Fall		
CHE 296	Winter		
CHE 296	Spring		
		Total	

3. Seminar (290 to 295) – at most 8 units.

Course Dept. & Number	Quarter Completed	Grade	Units
		Total	

4. Additional courses – upper division or graduate courses (excluding 29X seminar series and 299).

Course Dept. & Number	Quarter Completed	Grade	Units
		Total	

Total Number of Units in items 1-4 \_\_\_\_\_ (minimum 30 units required)

\_\_\_\_\_  
 Student Signature

\_\_\_\_\_  
 Research Advisor Signature

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Graduate Advisor Signature

\_\_\_\_\_  
 Date