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MASTER'S PROGRAMS

Master of Science with Major in Chemistry/[Link to Doctoral Program](#)

Admission Requirements

In addition to the University's general graduate admission requirements, the typical prerequisite for admission to the Master of Science in the Department of Chemistry and Biochemistry is the Bachelor of Science degree in Chemistry or its equivalent. Students must have achieved a minimum 3.0 GPA in the last 60 credits of undergraduate work, a "B" average in chemistry courses taken at the junior and senior undergraduate levels, or scores of at least 150 (verbal) and 152 (quantitative) on the Graduate Record Exam.

Degree Program

Master of Science (M.S.) students will be required to complete the ~~three~~^{five} core courses as well as three electives. These electives may be selected from graduate-level courses offered in the Department of Chemistry and Biochemistry or other departments ~~in the University~~ ^{in the Charles E. Schmidt College of Science}. Elective courses must be approved by the student's research advisory committee. Students must also write a thesis describing their research, which must be approved by the research advisory committee. The thesis must be defended successfully by the student in an oral exam with the research advisory committee. The student's research advisory committee must consist of at least three members, two of whom are members of the Chemistry and Biochemistry graduate faculty. One committee member must be from outside the Department of Chemistry and Biochemistry and must also hold an appointment to the graduate faculty. The minimum degree requirements are listed below. Student's taking the non-thesis option may take a maximum of three credits of Graduate Research under the direction of a chemistry faculty member and are not required to have a research advisory committee.

| Core Courses - 10 credits | | |
|--|------------------------------------|---------------------------|
| Introduction to Chemical Research | CHM 5944 | 1 |
| <u>Bioanalytical Methods and Applications</u> Instrumentation | CHM 61 37 ⁵⁷ | 2 ³ |
| <u>Current Topics in Bioanalysis</u> | <u>CHM 6937</u> | <u>1</u> |
| Synthesis and Characterization | CHM 6730 | 3 |
| Kinetics and Energetics of Reactions | CHM 6720 | 3 |
| Elective courses - 9 credits - Select three courses at the 5000, 6000 or 7000 level from the Chemistry Department | | 9 |

| Thesis Option - 11 credits | | |
|---|----------|-----------|
| Graduate Seminar (non-thesis) | CHM 6935 | 1 |
| Master's Thesis (1-12 credits) | CHM 6971 | 10 |
| Minimum Degree Total | | 30 |

| Non-Thesis Option - 11 credits | | |
|--|-----------------|----------|
| Graduate Seminar (non-thesis) | CHM 6935 | 1 |
| <i>The remaining 10 credits will be taken from either of the following courses or a combination of both</i> | | |
| <u>Advanced Biochemistry</u> | <u>BCH 6740</u> | <u>3</u> |
| <u>Organic Chemistry 3</u> | <u>CHM 5224</u> | <u>3</u> |

| | | |
|---|------------------------------------|--------------------------|
| <u>Drug Design</u> | <u>CHM 6278</u> | <u>3</u> |
| <u>Advanced Drug Development</u> | <u>CHM 6277C</u> | <u>3</u> |
| <u>Structural Biochemistry</u> | <u>CHM 6351</u> | <u>3</u> |
| <u>Materials Chemistry</u> | <u>CHM 5716</u> | <u>3</u> |
| <u>Graduate Research</u> | <u>CHM 6918</u> | <u>1-3</u> |
| <u>Advanced Drug Formulation</u> | <u>CHM 6279C</u> | <u>3</u> |
| <u>Advanced Topics in Biochemistry</u> <u>Graduate Research</u> | <u>BCH 6930</u> <u>CHM 6918</u> | <u>3-4</u> <u>4-2</u> |
| <u>Medicinal Chemistry</u> <u>Advanced Research in Chemistry</u> | <u>CHM 6428</u> <u>CHM 7978</u> | <u>3-9</u> |
| <u>Chemistry for Environmental Scientists</u> | <u>CHS 6611</u> | <u>3</u> |
| <u>Advanced Topics in Organic Chemistry</u> | <u>CHM 6380</u> | <u>3</u> |
| Minimum Degree Total | | 30 |

Master of Science Along the Way to the Ph.D. (Master's *en Passant*)

Ph.D. students wishing to earn the non-thesis master's degree along the way are required to have passed the Ph.D. candidacy exam and have completed the following courses:

| | | |
|---|-----------------|-----------|
| Introduction to Chemical Research | CHM 5944 | 1 |
| <u>Bioanalytical Methods and Applications</u> | <u>CHM 6137</u> | <u>2</u> |
| <u>Current Topics in Bioanalysis</u> | <u>CHM 6937</u> | <u>1</u> |
| <u>Instrumentation</u> | <u>CHM 6157</u> | <u>3</u> |
| Synthesis and Characterization | CHM 6730 | 3 |
| Kinetics and Energetics of Reactions | CHM 6720 | 3 |
| <i>Graduate elective courses</i> | | 9 |
| Graduate seminar (non-thesis) | CHM 6935 | 1 |
| Advanced Research in Chemistry (1-9 cr.) | CHM 7978 | 10 |
| Minimum Degree Total | | 30 |



Master of Science in Teaching (Chemistry)

In addition to the University's general graduate admission requirements, the typical prerequisite for admission to the Master of Science in Teaching degree program in the Department of Chemistry and Biochemistry is the Bachelor of Arts degree in chemistry or its equivalent. Students must have achieved a minimum 3.0 GPA in the last 60 credits of undergraduate work or scores of at least 148 (verbal) and 147 (quantitative) on the Graduate Record Exam.

Degree Program

The M.S.T. in Chemistry program provides post-baccalaureate education for secondary teachers, community college instructors and other individuals who wish to pursue these careers. The degree program requires a minimum of 30 credits of graduate coursework. Students also perform graduate research under the supervision of a Department of Chemistry and Biochemistry faculty member, typically with a chemical education theme, and culminating in the presentation of a graduate seminar. The minimum degree requirements are listed below.

| | | |
|-----------------------------------|----------|---|
| Core Courses - 10 credits | | |
| Introduction to Chemical Research | CHM 5944 | 1 |

| | | |
|--|------------------|-----------|
| Bioanalytical Methods and ApplicationsInstrumentation | CHM 6137CHM 6157 | 23 |
| Current Topics in Bioanalysis | CHM 6937 | 1 |
| Synthesis and Characterization | CHM 6730 | 3 |
| Kinetics and Energetics of Reactions | CHM 6720 | 3 |
| Electives - 9 credits - Select three courses from the following, maximum of 3 credits at the 5000 level | | |
| Advanced Biochemistry | BCH 6740 | 3 |
| Organic Chemistry 3 | CHM 5224 | 3 |
| Drug Design | CHM 6278 | 3 |
| Advanced Drug Development | CHM 6277C | 3 |
| Structural Biochemistry | CHM 6351 | 3 |
| Materials Chemistry | CHM 5716 | 3 |
| Advanced Drug Formulation | CHM 6279C | 3 |
| Advanced Topics in Biochemistry | BCH 6930 | 3 |
| Medicinal Chemistry | CHM 6428 | 3 |
| Chemistry for Environmental Scientists | CHS 6611 | 3 |
| Advanced Topics in Organic Chemistry | CHM 6380 | 3 |
| Advanced Topics in Biochemistry | BCH 6930 | 3 |
| Organic Chemistry 3 | CHM 5224 | 3 |
| Advanced Organic Chemistry | CHM 6225 | 3 |
| Advanced Topics in Organic Chemistry | CHM 6380 | 3 |
| Topics in Chemistry | CHM 6830C | 1-4 |
| Chemistry for Environmental Scientists | CHS 6611 | 3 |
| Special Topics | PCB 6933 | 1-8 |
| <i>Up to 6 credits may be selected from the College of Education</i> | | |
| Other Requirements - 5 credits | | |
| Graduate Research (<i>may be taken over multiple terms</i>) | CHM 6918 | 4 |
| Graduate seminar (non-thesis) | CHM 6935 | 1 |
| Education Requirements - 6 credits - select two courses from the College of Education | | |
| Minimum Degree Total | | 30 |



DOCTORAL PROGRAM

Doctor of Philosophy with Major in Chemistry

The Ph.D. program in the Department of Chemistry and Biochemistry focuses on Chemical Biology and allows students to pursue a research program in all of the disciplines of chemistry.

Admission Requirements

The minimum admission requirements for the Ph.D. program in the Department of Chemistry and Biochemistry are a minimum 3.0 GPA in the last 60 credits of undergraduate work, a "B" average in chemistry courses taken at the junior

and senior undergraduate levels, or and scores of at least 150 (verbal) and 152 (quantitative) on the Graduate Record Exam. **The Ph.D. program in Chemistry requires 80 credits, minimum.**

Degree Program

Students will be required to complete three-five core courses as well as three electives. If students have completed graduate-level courses previously, they may be substituted for one or more electives at the discretion of the Department of Chemistry and Biochemistry Graduate Programs Committee. Elective courses must be approved by the student's research advisory committee. Students must also complete Introduction to Chemical Research and present a seminar to the department (1 credit each). In addition to the courses listed below, Ph.D. students are required to earn Advanced Research in Chemistry (CHM 7978) credits until they are admitted to candidacy.

| Core Courses - 10 credits | | |
|--|------------------------------------|----------------------|
| Introduction to Chemical Research | CHM 5944 | 1 |
| <u>Bioanalytical Methods and Applications</u> <u>Instrumentation</u> | <u>CHM 6137</u> <u>CHM 6157</u> | <u>2</u> <u>3</u> |
| <u>Current Topics in Bioanalysis</u> | <u>CHM 6937</u> | <u>1</u> |
| Synthesis and Characterization | CHM 6730 | 3 |
| Kinetics and Energetics of Reactions | CHM 6720 | 3 |
| Electives - 9 credits - Select three courses at the 5000, 6000 or 7000 level from the Chemistry Department. May not select Graduate Research, CHM 6918, as an elective. | | |
| Other Requirements -36 credits | | |
| <u>Graduate seminar (non-thesis)</u> | <u>CHM 6935</u> | <u>1</u> |
| Research -11 credits - up to 35 credits - Advanced Research in Chemistry credits are taken to fulfill full-time enrollment requirements while advancing toward candidacy. | | |
| <u>Graduate Research</u> | <u>CHM 6918</u> | <u>1-11</u> |
| Advanced Research in Chemistry | CHM 7978 | 1-9 |
| Dissertation - 25 credits (minimum)-taken after admission to candidacy | | |
| Dissertation (minimum) | CHM 7980 | 25 |
| Minimum Degree Total | | 80 |

Each student's research advisory committee must have at least four members, three of whom are members of the Chemistry and Biochemistry Ph.D. program's graduate faculty. One committee member must be from outside the Department of Chemistry and Biochemistry and have graduate faculty status.

Admission to Candidacy

The Candidacy Exam must be attempted within three months of finishing all coursework and successfully completed within five months. This exam will be specifically designed for each student by the student's research advisory committee according to department guidelines and will focus on the student's selected area of research. Students will be admitted to candidacy upon successful completion of the Candidacy Exam and thereafter must enroll in CHM 7980, Dissertation.

Research Proposal

In addition to presenting a proposed plan for thesis research activities to the advisory committee, students must also complete an independent research proposal in a field distinct from their thesis research. This proposal is to be completed within three months of completing the Candidacy Exam. The goal of this exercise is for the student to prepare an original written research proposal and successfully defend this orally to his/her committee. This is designed to test the student's ability to identify and design a research project, which will test problem-solving skills and ability to distill relevant literature and design appropriate experiments to address specific research questions.

Dissertation

Students must also write a dissertation describing their research, which must be approved by the research advisory committee. The dissertation must be successfully defended by the student in an oral exam with the research advisory committee.

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