

# PHARMACOLOGY

*The Interdisciplinary Ph.D. program is no longer accepting applications. The Civil Engineering, Computer Science, Economics, Education, Electrical and Computer Engineering, Humanities, Mechanical Engineering, and Natural Sciences Ph.D. programs are now open for applications. Please inquire to [umkcs@umkc.edu](mailto:umkcs@umkc.edu) with any questions.*

## Discipline Coordinator

**Dr. Gerald Wyckoff**

Pharmacology faculty who are members of the Doctoral Faculty.

Pharmacology is a discipline in the Interdisciplinary Ph.D. (<https://catalog.umkc.edu/colleges-schools/graduate-studies/interdisciplinary-phd-program/>) Program administered by the School of Graduate Studies.

**Note:** The discipline-specific requirements listed here are *in addition* to the requirements listed in Interdisciplinary Ph.D. Application Procedure and Minimum Criteria for Admission and Minimum Interdisciplinary Ph.D. Academic Regulations and Degree Requirements.

## Discipline-Specific Admission Requirements

Due to course sequencing, new students will ordinarily be accepted only in the fall term. Applicants must hold a professional degree in pharmacy (Pharm.D. or B.S.) or a baccalaureate degree in biological, chemical science or health science. In special situations, baccalaureate degrees in other disciplines will be evaluated for possible admission. For graduates of foreign schools, the applicant must have completed a course of study at least the equivalent of a U.S. baccalaureate degree.

Prospective students must have an aggregate minimum grade-point average of 3.0 on a 4.0 scale for all college work taken prior to the bachelor's degree, or an aggregate GPA of at least 3.5 on all post-baccalaureate work to date (minimum of nine hours). For graduates of foreign schools, the applicant must have above-average grades in previous college study.

Prospective students must have a minimum aggregate GRE score of 295 for verbal and quantitative and 3.5 out of 6.0 for analytical writing.

For graduates of foreign schools, the applicant must have a minimum score of 550 on written or 213 computer-based or 79 on Internet-based TOEFL exam or alternatively, a minimum score of 6 on the IELTS.

## Qualifying Requirements for Full Admission

Students seeking admission to the Pharmacology discipline of the Interdisciplinary Ph.D. program should have completed coursework in organic chemistry I and II, biochemistry I and II, calculus, anatomy, microbiology, physiology I and II and a biostatistics course. Deficiencies existing on admission must be satisfied during the first two semesters of graduate work. In addition, during the first year of graduate study, provisional Ph.D. students with Pharmacology as a discipline must complete the following courses with a grade of B or better:

Code	Title	Credits
PHARM 5509	Toxicology	3
PHARM 5519	Pharmacology I	2
PHARM 5520	Pharmacology II	4
PHARM 5530	Pharmacology III	4
PHARM 5615	Methods In Pharmacology And Toxicology	3
<b>Total Credits</b>		<b>16</b>

## Suggested Compatible Co-disciplines

Cell Biology and Biophysics (<https://catalog.umkc.edu/colleges-schools/graduate-studies/cell-biology-biophysics/>), Chemistry (<https://catalog.umkc.edu/colleges-schools/graduate-studies/chemistry/>), Molecular Biology and Biochemistry (<https://catalog.umkc.edu/colleges-schools/graduate-studies/molecular-biology-biochemistry/>), Pharmaceutical Science (<https://catalog.umkc.edu/colleges-schools/graduate-studies/pharmaceutical-sciences/>)

## Core Program Requirements

### Pharmacology as Primary Discipline

Specific course requirements will be determined by the student in consultation with the research advisor and the supervisory committee. Generally, 65 post-baccalaureate credit hours, including 12 hours of research and dissertation and 45 hours of coursework, are required for the Ph.D. degree. No more than 27 credit hours (60 percent) can be obtained from a single discipline (preferably in Pharmacology). The remaining 18 credit hours (40 percent) can be obtained from one or more participating disciplines. No more than 25 percent of the coursework (~11 credits) from non-participating

disciplines will be counted toward the Ph.D. degree. More co-disciplines will be required. As many as 15 credits may be allowed for courses taken in a master's degree program at another institution with the concurrence of the student's supervisory committee.

Code	Title	Credits
<b>Pharmacology Requirements</b>		
PHARM 5519	Pharmacology I	2
PHARM 5520	Pharmacology II	4
PHARM 5530	Pharmacology III	4
PHARM 5509	Toxicology	3
PHARM 5615	Methods In Pharmacology And Toxicology	3
PHARM 5580C	Seminar in Pharmacology/Toxicology	1
<b>Additional Requirements</b>		
EDUC-R&P 5505	Statistical Methods I	3
Co-Discipline courses <sup>1</sup>		7-11
Advanced courses (5500-level or above) <sup>2</sup>		3-7
<b>Total</b>		<b>45</b>
PHARM 5699C	Research And Dissertation Pharmacology	12

<sup>1</sup> 7-11 credit hours in one or a combination co-disciplines, which may include Cell Biology and Biophysics, Chemistry, Molecular Biology and Biochemistry, Oral and Craniofacial Sciences, Pharmaceutical Science or other pertinent areas as approved by the supervisory committee.

<sup>2</sup> 2-6 credit hours of advanced courses (5500 level or above) Pharmacology or related areas as approved by the supervisory committee.

## Other Electives

A supervisory committee may require that additional coursework be taken to prepare the student in a specific research area. This additional requirement may not exceed six credit hours, may be taken in any approved doctoral discipline and must be completed prior to the semester in which the dissertation defense occurs.

## Pharmacology as Co-discipline

Students who apply for Pharmacology as a co-discipline should have completed coursework equivalent to LS-PHYS 399 and LS-PHYS 400, which are offered at UMKC. Deficiencies existing on admission must be satisfied during the first two semesters of graduate work. When Pharmacology is chosen as the co-discipline, the minimum course requirements are completion of PHARM 5519, PHARM 5520 and one credit hour of PHARM 5580C, plus sufficient courses constituting the required percentage of their program of study, as approved by the supervisory committee. No C grade in any core course will be permitted. Students who receive more than one C grade on elective courses will be dropped from Pharmacology as a co-discipline. Students must take and successfully pass a written and oral Comprehensive Examination administered by the supervisory committee members from the Division of Pharmacology. Co-discipline students should take the Pharmacology Comprehensive Examination no later than one semester after completing their required co-discipline coursework.

## Other Discipline-Specific Special Requirements

### Additional Coursework

Students will be expected to complete at least three credit hours of statistics. Students are expected to take sufficient computer courses or training as to be proficient in word processing and the use of spread sheets and data bases.

### Retention in Program

Graduate students are required to maintain a cumulative grade-point average of B (3.0 on a 4.0 scale). In any semester when the cumulative GPA falls below 3.0, the graduate student will automatically be placed on probation. The student is allowed one semester to return to good academic standing (cumulative GPA of 3.0). A graduate student should not let the cumulative GPA fall below 3.0 in two semesters throughout the entire program. Students who receive a grade of C in six credit hours or more, or who receive a grade lower than C, or one no-credit grade will be dismissed from the graduate school. Any C grade in courses offered by the Pharmacology division should be repeated no more than once.

### Appeals

For special requests or disputes concerning a student's Ph.D. program, written appeals with documentation must first be submitted to the student's supervisory committee. If a resolution of the problem cannot be obtained at the supervisory committee level, the written appeals process must then progress through the following levels:

1. Division Chair, Pharmacology.
2. Graduate Programs Committee, School of Pharmacy.

3. Interdisciplinary Ph.D. Program Director.
4. Dean, School of Graduate Studies.

## **Comprehensive Examination Guidelines**

The graduate school requires that a student demonstrate adequate intellectual mastery of the field of specialization and of appropriate co-discipline fields by passing a Comprehensive Examination before being admitted into candidacy for the Ph.D. degree. To satisfy this requirement the student must pass two parts of the Comprehensive Examination given by the supervisory committee.

The Comprehensive Examination must be taken before the beginning of the student's third year after admission to full-time graduate study at UMKC. The Comprehensive Examination consists of both written and oral components. The format of the Comprehensive Examination consists of the writing and oral defense of a research proposal in the style of an NIH grant. This topic of the proposal is in an area distinct from the student's intended dissertation project and approved by the committee in advance of the examination.

### **Written Examination**

The written examination will consist of a National Institutes of Health (NIH) grant proposal including Specific Aims, Methods, and Research Design sections; budget pages are unnecessary. The content will integrate fundamental knowledge from both the primary discipline and co-disciplines. The written proposal must be submitted to the supervisory committee at least two weeks in advance of the oral portion of the examination.

### **Oral Examination**

The oral examination shall consist of the student's presentation of their grant to the supervisory committee in order that the committee can evaluate the student's critical thought process and the student's ability to develop and defend an original research proposal. The oral examination includes (1) questions covering the grant proposal prepared by the student for the written examination and (2) other related material in the student's area of specialization, including fundamental knowledge of the primary discipline and co-discipline(s).

On satisfactory completion of the written and oral portions of the Comprehensive Examination, the student becomes a candidate for the Ph.D. In the event a student does not pass the examination, one additional attempt may be made at a date no sooner than 12 weeks, and within one year, of the original attempt. A student who fails either the written or the oral examination a second time will be automatically dropped from the program.

A student must pass the doctoral Comprehensive Examination and advance to Ph.D. candidacy within four years from the beginning of doctoral coursework (within three years if entering with a master's degree in the same or closely related field). After the establishment of degree candidacy, a maximum of four years will be allowed for completion of degree requirements (three years for students with a master's degree). Failure to complete the work within the periods specified will necessitate re-evaluation of the entire program and may result in a notice of termination.