COLLEGE OF PHARMACY

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Department of Pharmacy Practice
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COLLEGE OF PHARMACY

Accreditation

The College of Pharmacy holds membership in the American Association of Colleges of Pharmacy, is recognized as an institution in good standing by the Ohio State Board of Pharmacy and is accredited by the Accreditation Council for Pharmacy Education (ACPE).

Programs in Pharmacy and the Pharmaceutical Sciences

The College of Pharmacy prepares students for careers in both the pharmaceutical sciences and the profession of pharmacy. Those who do not seek professional licensure may work in the medical, legal and biomedical professions. Those who enter the profession of pharmacy provide direct patient care services.

Doctor of Pharmacy - Pharmacy Licensure Program

All students seeking a degree that will lead to pharmacy licensure will need to complete two years of course work in the preprofessional division of the College of Pharmacy. Following the completion of a core set of required courses, students will apply to the professional division during their second year. Admission to the professional division of the college (year 3) is competitive.

The program of study leading to pharmacy licensure for entering freshman is the entry-level doctor of pharmacy (Pharm.D.). Students who have already completed a bachelor of science in pharmacy (B.S.P.) degree may enroll in the post-baccalaureate Pharm.D. degree program in order to gain additional skills and knowledge in various therapeutic areas.

Pharmaceutical Sciences

The College of Pharmacy offers a four-year bachelor of science in pharmaceutical sciences degree (B.S.P.S.) to prepare students for a variety of careers in the pharmaceutical and biotechnological industries. Students seeking the B.S.P.S. degree will need to complete two years of course work in the preprofessional division of the College of Pharmacy. Following the completion of a core set of required courses, students will apply to the professional division during their second year. Admission to the professional division of the college is competitive. The B.S.P.S. will not prepare students for state board licensure, nor will it prepare students to practice pharmacy.

Contingent Admission

A small group of academically exceptional high school graduates may be offered contingent admission to the professional division of either the Pharm.D. or the B.S.P.S. programs. Automatic admission to the third year of the curriculum will be contingent upon successful completion of the first and second preprofessional years, while maintaining specific scholastic standards.

Pharmacy Graduate Degree Programs

The College of Pharmacy offers several non-licensure graduate degrees: the master of science in pharmaceutical sciences degree with program options in pharmacology/toxicology, industrial pharmacy and administrative pharmacy; the master of science in medicinal chemistry degree; and the doctor of philosophy in medicinal chemistry degree. Students should contact the College of Pharmacy for admission and curricular requirements.

A graduate certificate program is available to any qualifying student holding a B.S. degree in natural science who wishes to take graduate level courses in pharmacology and toxicology. Students completing this 15 semester hour program will be awarded a certificate in pharmacology/toxicology.

Admission to the College

New Students

All new students admitted to the College of Pharmacy will begin their studies in the preprofessional division. All undergraduate students in the College of Pharmacy will be considered preprofessional division students until admitted to the professional divisions of the Pharm.D. or B.S.P.S. program. For the entry-level Pharm.D. and the four-year B.S.P.S. programs, the College of Pharmacy limits student enrollment into the professional division (third year) in accordance with its facilities.

Transfer and Change-of-College Students

In order for a student to transfer from other Ohio universities into any of the baccalaureate programs of the College of Pharmacy or change from another college within The University of Toledo to the College of Pharmacy, the student must have a higher education cumulative grade point average (HEd GPA) of at least 2.7 (the HEd GPA is based on all letter grades attained at all institutions of higher learning and uses the point average scale of A = 4 pt.), be in good standing at the University, and be eligible to return. Evaluation of transcripts from other institutions is not done until a student is admitted into the College of Pharmacy. The student may be required to take placement tests in English, chemistry and/or algebra. A student who has attended another Ohio college of pharmacy must have a cumulative HEd GPA of 2.7, be in good standing at the university and be eligible to return to the college of pharmacy previously attended. Transfer students who wish to apply to the professional division must have been enrolled in The University of Toledo College of Pharmacy and registered for 16 semester hours (a letter grade must be received in each course) prior to application to the professional division.

Students with course work from non-Ohio institutions will be evaluated on an individual basis. After a student is admitted, the student may be asked to supply non-returnable college catalogs so that course equivalencies can be determined. The student also may be required to take placement tests in English, chemistry and/or algebra. All international transcripts submitted by transfer students must be evaluated by a College of Pharmacy-designated independent agency, at the applicant’s expense, for letter grade equivalency. Transfer students are only admitted to the preprofessional division of the B.S. in pharmaceutical sciences or the Pharm. D. program. For a transfer student to be accepted into the second year of the program, all criteria and prerequisites for second-year class standing must be met. Second-year class standing begins only in the fall semester.
General Criteria for Admission to the Professional Divisions of the Doctor of Pharmacy and the B.S. in Pharmaceutical Sciences

Students are admitted to the professional divisions for the fall semester. The number of students who receive final acceptance into the professional divisions will be limited to the space available. Because the number of applicants usually exceeds the number of spaces available, students are admitted on the basis of the following general criteria.

Eligibility for Application

To be eligible to apply for admission into the professional divisions, all applicants must complete the following or their equivalents:
- BIOL 2150, 2160, 2170, 2180
- CHEM 1230, 1240, 1280, 1290, 2410, 2460
- MATH 1750
- PHCL 2600
- PHPR 2010
- PHYS 1750 or 2070
- A minimum of 44 earned semester hours
- A minimum 2.7 of both cumulative grade point average (GPA) and science GPA
- Currently matriculated in The University of Toledo College of Pharmacy

Application

Applicants to the Pharm.D. program will provide the Admissions Committee with a personal essay to be written at a designated time, date and location as indicated on the College of Pharmacy Internal Admissions Web site. At the time of the writing of the personal essay, all application materials must be submitted. These include the following:
- Signed confirmation form
- Pending grade change form (if applicable)
- Two signed letters of recommendation
  - Note: The letters may be from professors, employers, clergy, close family friends and family health professionals (pharmacist, dentist and physician), or others. Letters from relatives or The University of Toledo College of Pharmacy faculty or staff are not acceptable.

Applicants to the B.S.P.S. programs will submit the following by the deadline published on the College of Pharmacy Internal Admissions Web site:
- Signed confirmation form
- Pending grade change form (if applicable)

There are no exceptions to the deadlines.

Final Admission

In order to be finally admitted into the professional division, an applicant must have completed the following or their equivalents:
- BIOL 2150, 2160, 2170, 2180
- CHEM 1230, 1240, 1280, 1290, 2410, 2420, 2460, 2470
- MATH 1750 and 1760
- ECON 1200
- PHCL 2600 and 2620

If an applicant is accepted into the professional division, the acceptance will be provisional pending the completion of the above requirements. All course prerequisites for the professional divisions must be completed two weeks before the first day of professional division classes in the fall semester for which the application is made. If the applicant fails to meet the deadline for the completion of prerequisite courses, he/she will lose provisional admission status and must apply again for admission to the professional divisions in a subsequent year. It is the student’s responsibility to contact the coordinator of internal admissions in the Office of Student Affairs if he/she plans to complete requirements over the summer prior to the start of the third year. A preprofessional division student will not be allowed to fulfill requirements for the professional divisions by enrollment in both organic chemistry and physics during the summer prior to the first professional division year.

Evaluation

Each application will be evaluated on the basis of the applicant’s:
- Personal essay (for Pharm.D. applicants only)
- Cumulative GPA
- Science GPA in the following specified courses:
  - CHEM 1230, 1240 and 2410
  - BIOL 2150 and 2170
  - MATH 1750
  - PHYS 1750 or 2070
  - PHPR 2010

The Admissions Committee will use the best grade for the first two of all attempts for any science course used in the calculation of the science GPA. This rule applies to all applicants, including transfer students. All transfer or quarter courses equivalent to these specified courses will be evaluated for their respective equivalent semester hours. All applicants must have a cumulative GPA based upon a minimum of 16 semester hours at The University of Toledo (a letter grade must be received in each course). If a student has taken fewer than 30 hours at The University of Toledo, the higher education GPA (HEd GPA, which is based on all letter grades attained at all institutions of higher learning) will be used in the evaluation in place of the UT cumulative GPA, if the HEd GPA value is less than the UT cumulative GPA. If the HEd GPA is greater than the UT cumulative GPA, the latter will be used.

Students to be admitted provisionally to the Pharm.D. program will be selected by the Admissions Committee based on the above criteria. A portion of the students will also be interviewed by the Admissions Committee.

Transfer Students

Specific criteria have been approved by the faculty of the College of Pharmacy for the admission of transfer students or of change-of-college students into the professional divisions. These are outlined as follows:

a) Transfer students who wish to apply to the professional division must have been enrolled in The University of Toledo College of Pharmacy and registered for 16 hours (a letter grade must be received in each course) prior to application.
b) The general criteria for admission to the professional divisions will be applied to the transfer student in the same manner as for the continuing College of Pharmacy student; i.e., cumulative GPA, science GPA, essential courses or their equivalents through the fall semester of the second year, personal essay (for Pharm. D. applicants) and an accumulation of at least 44 earned semester hours. The applicant’s cumulative GPA from The University of Toledo or HEd GPA (as determined above), science GPA based on equivalent specified courses (UT or otherwise) as stated above, and personal essay (for Pharm.D. applicants) will be used in determining admission.

c) The essential courses for final admission to the professional divisions consist of those listed above. Equivalencies must be determined and appear on the student’s transcript and/or in the student’s degree audit prior to application. In general, a three-quarter course sequence is necessary to fulfill a two-semester course sequence. See an adviser for further information.

d) In surveying the essential courses, the Admissions Committee has observed that equivalency is almost automatic for courses in general chemistry, general biology, organic chemistry and physics. Difficulty in determining equivalency has occurred with Introduction to Patient Care, the mathematics sequence and the functional anatomy and pathophysiology sequence.

e) The only pharmacy courses a preprofessional student is permitted to take through the College of Pharmacy are PHPR 1000, PHPR 2010, PHCL 2600 and PHCL 2620 until final admission to the professional divisions is achieved.

College of Pharmacy Honors Program

The College of Pharmacy offers an Honors Program for eligible students in all its undergraduate programs as part of the University-wide Honors Program.

Highly qualified students entering the University in the College of Pharmacy will be considered for advanced placement and for entry into honors courses and honors sections of major courses offered in the first two years. Decisions regarding entry of students into the University Honors Program or into specific honors courses will be made after evaluation of the honors application by the University Honors Program director and the College of Pharmacy Honors advisers. Normally, entering students with an ACT composite score of 28 and above, coupled with a 3.75/4.00 high school GPA, will be considered for entry into honors courses. During the first two years of study, the College of Pharmacy offers courses that orient the student toward the profession of pharmacy and the pharmaceutical sciences and toward the moral and ethical responsibilities of pharmacists and pharmaceutical scientists. Many honors students take most of their honors coursework (both required and elective courses) in the first two years of the curriculum.

A variety of required and elective courses are also offered with honors sections in the professional divisions. A specific honors seminar course and an honors thesis option are offered for some of the very best students in the program. These courses can fulfill requirements for electives. In addition to the overall college requirement, specific departmental requirements, on file in the respective department offices, also must be met for graduation from the College of Pharmacy with honors.

The B.S.P.S. with College Honors is attainable by all students who complete at least 33 semester hours of honors course work with a grade of B or better and who have a cumulative GPA of 3.3 or better. In addition, at least five hours of the 33 noted above must be taken within the honors thesis project and honors seminar. These courses are to be taken within the departments of medicinal and biological chemistry, pharmacology or pharmacy practice. Graduation with Departmental Honors is also available to students who are not members of the university Honors Program, but who meet departmental requirements.

Academic Policies

The College of Pharmacy adheres to all of The University of Toledo policies and procedures. Please refer to the General Section of this catalog for academic policies governing all students enrolled at the University. In any case where University, college and/or departmental policies conflict, the most stringent policy applies unless waived by the college. Students should consult with the college for a complete listing of all policies and procedures specifically related to the College of Pharmacy.

Attendance Requirements

Students in a professional school, as responsible individuals, are expected to attend all class meetings. The maximum number of permissible absences in a course is at the discretion of the individual faculty member. The penalty for excessive absences will be determined by the faculty member.

Withdrawal, Grade Deletion and Audit Policy

Refer to the University General Academic Policies in the General Information section of this catalog for Drop, Withdrawal, Grade Deletion and Audit policies that apply to all students.

Pass/No Credit (P/NC) Grade Option

Refer to the University General Academic Policies in the General Section of this catalog for General Academic Policies that apply to all students. P/NC grading is not available for courses taught in the College of Pharmacy. In addition to courses for which P/NC grading is used exclusively, a student may elect P/NC grading for an additional seven credit hours excluding course work in the natural sciences (biology, chemistry, physics and mathematics with the exception of MATH 0980). These seven P/NC hours are applicable only to courses in the humanities/fine arts, multicultural studies and social sciences. Once the petition is filed, the request is irrevocable.

Personal Fitness

The emotional and psychological stability of those practicing or preparing to practice pharmacy is considered to be very important for the proper performance of professional responsibility as a member of the health team. The faculty of the College of Pharmacy recognizes that, if a student exhibits behavior suggesting an emotional or psychological abnormality bearing a reasonable relation to that student’s ability to function competently in health care delivery systems, such behavior may present a hazard not only to the student, but to patients as well. If any behavior pattern provides reason to believe that a student’s psychological or emotional state may have rendered that student incompetent or unsafe, the dean of the college shall meet with that student and attempt to resolve the situation by referral to the University Health Service, University Counseling Center and/or
withdrawal from the pharmacy program.

**Ethical Responsibility**

The most serious offense with which pharmacy students may become involved is the misuse of and/or dependence upon dangerous drugs. The College of Pharmacy views the admitted or proven personal abuse of such drugs, their transmission or sale to other individuals or the use of drug documents to illegally obtain controlled or legend drugs as unprofessional conduct, which may result in dismissal from the College of Pharmacy. In addition, Boards of Pharmacy may revoke the internship license and/or deny licensure for various drug offenses. Since a current internship license is necessary for entrance into the experiential rotations in the required component of the College of Pharmacy curriculum, students without an internship license will be denied admission into these classes. Drug abuse in any form and/or misuse of drug documents must be totally avoided.

**Academic Performance Standards**

Please refer to the General Section of this catalog for General Academic Policies governing all students enrolled at the University.

For students entering into the professional division of the B.S.P.S. Pharm. D. major program:

a) Students must maintain a cumulative pharmacy core-curriculum GPA of ≥ 3.0. Beginning in the first year of the professional division, students whose semester or cumulative pharmacy core-curriculum (see below) GPA falls below 3.0 will be given an academic warning, and allowed one semester to restore their GPA to a semester or cumulative pharmacy core-curriculum level of ≥ 3.0. A student with two or more consecutive semesters with a semester or cumulative pharmacy core-curriculum GPA < 3.0 will undergo a record review by the College of Pharmacy Academic Performance Committee that may result in dismissal from the Pharm.D. program.

b) A grade below a C (2.0) in any pharmacy core-curriculum course is unsatisfactory and will not be considered a passing grade for the course in the Pharm.D. curriculum (i.e., courses for which grades of less than a C are earned must be repeated).

c) Grade deletion for graduate courses is not allowed by the University.

For students entering the post-B.S.P.S. (graduate) portion of the Pharm. D. curriculum:

a) Students must maintain a GPA of 3.0. This GPA will be computed beginning from the first semester of the post-B.S.P.S. (graduate) coursework, and will include all graduate level courses (see below). Students whose semester or cumulative pharmacy core-curriculum GPA falls below 3.0 will be given an academic warning, and allowed one semester to restore their GPA to a semester or cumulative pharmacy core-curriculum level of ≥ 3.0. A student with two or more consecutive semesters with a semester or cumulative pharmacy core-curriculum GPA < 3.0 will undergo a record review by the College of Pharmacy Academic Performance Committee that may result in dismissal from the Pharm.D. program.

b) A grade below a C (2.0) in any pharmacy core-curriculum course is unsatisfactory and will not be considered a passing grade for the course in the Pharm.D. curriculum (i.e., courses for which grades of less than a C are earned must be repeated).

c) Grade deletion for graduate courses is not allowed by the University.

**Suspension**

Suspension is made by the dean on advice from the College of Pharmacy Academic Performance Committee, which reviews the performance of all students periodically. Suspension is from the University. The period of suspension is at least one semester, exclusive of the summer terms. A student who is suspended must petition the dean for readmission, in writing (with a copy to the associate dean for student affairs), at least five weeks prior to the beginning of the semester to which the petition is directed. If the petition is accepted, the college will determine the conditions under which the student will be permitted to reenroll. If a student is readmitted and does not perform satisfactorily, permanent dismissal from the College of Pharmacy may result. A student who is on academic or disciplinary probation or suspension will be required to relinquish the duties of any office in the College of Pharmacy organizations until the student is in “Good Standing,” as defined below.

If a student is suspended, and therefore is ineligible to attend classes in a subsequent semester, that student must drop all of the courses for that semester.

**Good Standing**

The College of Pharmacy defines “good academic standing” in the following manner:

a) For all preprofessional students, and professional division students in the B.S.P.S. program (pharmacology/toxicology, medicinal and biological chemistry, pharmaceutics, and pharmacy administration majors): a cumulative GPA of 2.0 and a GPA of 2.0 for the semester.

b) For all professional division students in the B.S.P.S. Pharm.D. major and all students in the graduate portion of the Pharm.D. program: a cumulative pharmacy core-curriculum GPA of 3.0 and a GPA of 3.0 for the semester.

**Pharmacy Core-Curriculum**

Undergraduate core-curriculum courses taught in the College of Pharmacy beginning in the first year of the professional division:
Experiential Dismissal Policy

Pharmacy students may be dismissed from a clerkship site at any time during the rotation by the clerkship site and/or preceptor through the initiation of the dismissal procedure described below.

Actions Subject to Dismissal

Following are circumstances or actions under which clerkship students may be dismissed using the dismissal procedure described below:

* Failure to adhere to clerkship site policy and/or procedure.
* Failure to adhere to UT clerkship program policy and/or procedure.
* Failure to meet a UT clerkship program requirement.
* Blatantly unacceptable or continuously unacceptable clerkship program performance.
* Mistreatment of University of Toledo and/or clerkship site employees.
* The performance of an action that is detrimental to the care of a patient.
* The performance of an action that is detrimental to the clinical service provided by the site and/or preceptor.

Dismissal Procedure

When a circumstance or action that is determined to be grounds for dismissal occurs, the clerkship preceptor will inform the student and director of experiential programs of the situation. The situation will then be handled as follows:

a) If the situation is related to failure to meet a requirement, failure to follow policy or procedure, improper behavior or inadequate clerkship performance, the student will be given a specific outline by the clerkship preceptor as to how his/her performance must improve and/or meet expectations within five class days. A copy of this outline will be sent to the director of experiential programs. If after five class days such performance has not been achieved, the student will be removed from the clerkship site and will receive either a grade of U or IN as determined by the director of experiential programs.

b) If the situation is related to an action that is detrimental to patient care and/or to the clinical service, upon discussion of the situation between the clerkship preceptor and clinical coordinator, the student shall be subject to immediate removal from the clerkship site and shall receive a grade of U.

If a student has any question over the handling of his/her dismissal procedure by the director of experiential programs and/or preceptor, he/she should contact the chair of the department of pharmacy practice.

Student Grievances

Student complaints specifically related to Accreditation Council for Pharmacy Education (ACPE) standards should be submitted on the appropriate form to the College of Pharmacy Office of Student Affairs (WO 1227). Forms and a copy of the ACPE Standards are available in the Office of Student Affairs. Students can also find the ACPE Standards at the following Web site: http://www.acpe-accredit.org/standards/default.asp.

Administrators responsible for review and response to specific ACPE standards for accreditation are the following:

Standards for curriculum (standards 8-14) - assistant dean for...
academic affairs

Standards for students (standards 15-22) - associate dean for student affairs

All other standards (if applicable) - associate dean for student affairs

Student issues or complaints regarding specific courses should be resolved via discussion with the course instructor. If further resolution is required, the department chair should be consulted. Refer to the Academic Grievance section in the General Section of this catalog for further information.

College Level Examination Program Credit (CLEP)

The College of Pharmacy grants up to a maximum of 30 semester CLEP credits. Credits earned in the natural sciences and mathematics section of the CLEP examination will count toward the degree as free electives but do not replace the requirement for any specific course in biology, chemistry, physics or mathematics. Credits earned in the humanities and social sciences examination will count only toward meeting the additional humanities and social science requirements.

Credit by Exam

Refer to the General Section of this catalog for Credit by Exam policies that apply to all students.

Criteria for Class Standing

<table>
<thead>
<tr>
<th>Year</th>
<th>Criteria</th>
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</thead>
<tbody>
<tr>
<td>First</td>
<td>Earned less than 30 semester hours.</td>
</tr>
<tr>
<td>Second</td>
<td>Earned at least 30 semester hours, have a HEd GPA (as previously defined) of 2.5 or greater (based on the point average scale of A = 4.0) and enrolled for or completed organic chemistry, physics and functional anatomy and pathophysiology.</td>
</tr>
<tr>
<td>Third</td>
<td>Earned at least 63 semester hours and officially accepted into the professional division.</td>
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</tbody>
</table>

Note: The student is responsible for the correct selection of the program of study each semester and for the fulfillment of the requirements given here. Although advisers will assist wherever possible, the final responsibility rests with the student. The College of Pharmacy reserves the right to change its policies and procedures at any time. These changes will be binding on the date they are approved by faculty action. Courses taken at other colleges of pharmacy will not substitute for professional division courses. The only pharmacy courses a preprofessional student is permitted to take through the College of Pharmacy are PHPR 1000, PHPR 2010, PHCL 2600 and PHCL 2620. Only students admitted to the professional division will be allowed to take 3000- or 4000-level courses in the college.

Degree Requirements

Bachelor of Science in Pharmaceutical Sciences Degree Requirements

In response to the increasing demand for scientists, researchers, administrators, and professional sales representatives in the pharmaceutical fields, The University of Toledo College of Pharmacy offers the bachelor of science in pharmaceutical sciences (B.S.P.S.) degree program as one of the first in Ohio and one of the few in the nation. The bachelor of science in pharmaceutical sciences degree is a four-year baccalaureate program. Pharmaceutical sciences represent the collective basic sciences that underlie pharmacy. There are four majors under this degree program: medicinal and biological chemistry, pharmacology/toxicology, pharmaceutics and pharmacy administration.

This degree program is designed for students who wish to pursue careers related to the pharmaceutical industry, pharmaceutical science and research, pharmaceutical administration and sales, the biomedical industry, forensic science, as well as health care administration. It also prepares students to pursue medical school, law school or graduate studies. It does not prepare or qualify students for state board licensure in the practice of pharmacy. The degree that prepares students for professional practice and licensure is the doctor of pharmacy (Pharm.D.) degree.

General Program Requirements

A total of 132 semester hours are required for graduation with all the B.S.P.S. - non-Pharm.D. majors.

Preprofessional Division Requirements

In the preprofessional division, the first two years of the B.S.P.S program, students will be broadly trained in the arts, humanities and social sciences, although the natural sciences will receive emphasis. The curriculum of the preprofessional division of the College of Pharmacy is the same for the Pharm.D. and the B.S.P.S. degrees.

First Year

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<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>BIOL 2150</td>
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<tr>
<td>BIOL 2160</td>
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<td>CHEM 1230</td>
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<tr>
<td>CHEM 1290</td>
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<td>MATH 1750</td>
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<td>PHPR 1000</td>
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<tr>
<td>UT Core Requirement (ENG 1110)* ................................3</td>
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<table>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>BIOL 2170</td>
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<tr>
<td>BIOL 2180</td>
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<tr>
<td>CHEM 1240</td>
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<tr>
<td>CHEM 1290</td>
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<tr>
<td>MATH 1760</td>
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<tr>
<td>UT Core Requirement (ENG 1130 or equivalent)* ..................3</td>
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Second Year

<table>
<thead>
<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>CHEM 2410</td>
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<tr>
<td>CHEM 2460</td>
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<tr>
<td>PHCL 2600</td>
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<tr>
<td>PHPR 2010</td>
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<tr>
<td>PHYS 1750</td>
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<tr>
<td>UT Core Requirement (PSY 1010 or SOC 1010)* ................3</td>
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### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 2420</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 2470</td>
<td>Organic Chemistry Lab II</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 2620</td>
<td>Funct. Anat. &amp; Pathophysiology II</td>
<td>4</td>
</tr>
<tr>
<td>UT Core Requirement (ECON 1200)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UT Core Requirement (Humanities/Fine Arts)*</td>
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<td></td>
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<tr>
<td>UT Core Requirement (Humanities/Fine Arts)**</td>
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</table>

* Suggested sequence
** Select a course that will simultaneously fulfill a UT Multicultural Studies Core Curriculum requirement.

### B.S.P.S. Professional Division Requirements

In the professional division of the B.S.P.S. degree program, the last two years of the program, advanced courses of study and a practicum in each major lead to a unique concentration in the pharmaceutical fields. Admission requirements are listed under General Criteria for Admission to the professional divisions.

### Medicinal and Biological Chemistry (MBC) Major

**Medicinal and Biological Chemistry** is an interdisciplinary science. This major focuses on synthetic organic chemistry, biochemistry, molecular biology, biotechnology, pharmacology and pharmaceutical chemistry underlying the design, synthesis and development of drugs.

**Career Opportunities:** Professional chemists are in demand in industry, education, business, research organizations and the public sector. Students graduating from this major will be ideal for a variety of careers, such as drug analysts, research chemists, technical writers, sales representatives, biochemistry technical officers and forensic scientists. Employers include large and small pharmaceutical companies, biotechnology companies, hospital laboratories, government laboratories and the chemical industry. The broad base on which the major is structured does not limit employment to pharmaceutical or biotechnology options and also allows students to compete for positions requiring a knowledge of chemistry, such as in the petrochemical industry, wine industry, polymer industry, paint industry, etc. Graduates are also able to move on to graduate programs in the field, medical school or other professional schools.

### MBC Professional Division Curriculum

#### Third Year

**First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>Major Elective (Recommend BIOL 3010/3020)¹</td>
<td>3-5</td>
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<tr>
<td>Major Elective (Recommend CHEM 3310)³</td>
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**Second Semester**

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<tr>
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<td>Major Elective (Recommend MBC 3880)³</td>
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<td>UT Core Requirement (Multicultural Studies)</td>
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#### Fourth Year

**First Semester**

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<tr>
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<tr>
<td>MBC 4720</td>
<td>Advances in Drug Design (spring)</td>
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**Second Semester**

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<tbody>
<tr>
<td>MBC 4780</td>
<td>Practicum in Med. &amp; Biol. Chem.²</td>
<td>6-12</td>
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</table>

¹ Electives to be chosen with faculty adviser from the MBC Electives list.
² Practicum can, as an alternative, be taken in the summer before the fourth year, allowing the student to graduate a semester earlier. If the practicum is taken in the fall of the 4th year, the listed courses will be taken in the spring. The practicum sites require students to have an average GPA of 3.0 in all chemistry courses (CHEM and MBC).

### MBC Electives

A total of 25 hours of course work must be selected from the list of elective courses below.

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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<td>BIOL 3020</td>
<td>Molecular Genetics - Lab</td>
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<td>Cell Biology</td>
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<td>BIOL 4010</td>
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<td>Microbiology</td>
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<td>Immunology</td>
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<td>Parasitology</td>
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<td>CHEM 3610</td>
<td>Inorganic Chemistry</td>
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<td>Physical Chemistry for the Biosciences I</td>
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<td>Instrumental Analysis</td>
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<td>CHEM 4620</td>
<td>Inorganic Chemistry II</td>
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<td>MBC 3800</td>
<td>Microbiology &amp; Immunology</td>
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<tr>
<td>MBC 3880</td>
<td>Medicinal &amp; Biological Chem. Lab</td>
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<tr>
<td>MBC 4300</td>
<td>Chemotherapy and Immunotherapy</td>
<td>3</td>
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<td>MBC 4420</td>
<td>Neuroscience</td>
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<td>MBC 4430</td>
<td>Biochemistry of Disease</td>
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<td>MBC 4450</td>
<td>New Drug Development</td>
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<td>Advanced Immunotherapeutics</td>
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<td>MBC 4480</td>
<td>Chemical Defense Mechanisms in Plants</td>
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<td>Targeted Drug Design</td>
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<td>Advances in Drug Design</td>
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<td>Biochemical Toxicology</td>
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<td>Quantitative Structure Activity Relationships</td>
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<td>Adv. Immunology &amp; Tissue Culture Lab</td>
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<td>Biomedical Chem. Lab</td>
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<td>Medicinal Biotech Lab</td>
<td>1-10</td>
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<tr>
<td>MBC 4900</td>
<td>Hnsr Seminar in Med/Bio. Chem</td>
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<td>Problems in Bio-medicinal Chem.</td>
<td>1-3</td>
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<tr>
<td>MBC 4950</td>
<td>Research in Medicinal Chemistry</td>
<td>6-8</td>
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<tr>
<td>MBC 4950</td>
<td>Research in Medicinal Chemistry - Honors</td>
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<td>Hnsr Thesis in Medic Chem</td>
<td>2-5</td>
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<tr>
<td>MBC 4980</td>
<td>Special Topics in Drug Design</td>
<td>1-4</td>
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</table>
PHCL 4140 Interpretation of Pharmaceutical Data.................3
PHCL 4150 Biopharmaceutics/Pharmacokinetics....................4
PHCL 4700 Pharmacology III...........................................3
PHCL 4720 Pharmacology IV............................................3
PHCL 4730 Toxicology I................................................3
PHCL 4750 Toxicology II................................................3
PHCL 4760 Toxicokinetics...............................................3
PHCL 4770 Toxicological Risk Assessment............................3
PHCL 4800 Human-Xenobiotic Interactions...........................3
PHCL 4850 Drug Disposition............................................2

Pharmaceutics (PHAR) Major

Pharmaceutics is a multidisciplinary applied science that studies the physical and chemical attributes of drugs. It places a strong emphasis on the design and evaluation of drug delivery systems and dosage forms and also on the understanding and control of the factors influencing clinical response to drug therapy.

Career Opportunities: The breadth and depth of the program prepare students for a wide range of career opportunities. Graduates can work as drug analysts, manufacturing/production technologists, quality control inspectors, technical writers, sales representatives and research associates in the pharmaceutical industry, cosmetic industry, hospitals and university settings. Graduates can also move on to graduate studies in the field, medical school or other professional school.

PHAR Professional Division Curriculum

Third Year

First Semester

MBC 3310 Medicinal Chemistry I....................................3
MBC 3550 Physiological Chemistry I................................3
PHCL 3700 Pharmacology I............................................3
PHPR 3010 Pharmaceutical Calculations............................2
PHPR 3070 Pharmaceutics I............................................4

Second Semester

MBC 3320 Medicinal Chemistry II....................................3
MBC 3560 Physiological Chemistry II................................3
MBC 3800 Microbiology & Immunology............................3
PHCL 3720 Pharmacology II............................................3
PHPR 3080 Pharmaceutics II..........................................4

Summer between Third and Fourth Year

PHPR 4880 Practicum in Pharmaceutics..............................6-12

Fourth Year

First Semester

CHEM 3310 Analytical Chemistry.....................................2
PHCL 4150 Biopharmaceutics & Pharmacokinetics................4
PHCL 4700 Pharmacology III..........................................3
Pharmaceutics Electives*................................................2-3
UT Core Requirement (Multicultural Studies)*.......................3

Second Semester

BIOL 3030 Cell Biology..................................................3
BIOL 3040 Cell Biol. Lab.................................................2
CHEM 3360 Analytical Chemistry Lab................................2
PHCL 4720 Pharmacology IV............................................3
General Electives*.......................................................2-4

PHAR Electives

Pharmaceutics Electives (at least 2 hours)

PHPR 4010 Modern Drug Delivery....................................2
PHPR 4250 Sterile Products............................................2
PHPR 4680 Parenteral Manufacturing*...............................2
PHPR 4690 Dosage Form Design*....................................3
PHPR 4710 Selected Topics in Pharm. Tech.*.........................2
PHPR 4720 Pharmaceutical Rate Process*...........................2
PHPR 4900 Honors Seminar Pharmaceutics..........................3
PHPR 4910 Pharmacy Practice Problems.............................1-3
PHPR 4960 Honors Thesis Pharmacy Practice.........................5

General Electives (at least 2 hours)

BIOL 3010 Molecular Genetics.......................................3
BIOL 3020 Molecular Genetics Lab..................................2
BIOL 4110 Human Genetics............................................3
BIOL 4330 Parasitology..................................................3
CHEM 3710 Physical Chemistry for Bioscience I.....................3
CHEM 3720 Physical Chemistry for Bioscience II.....................3
CHEM 3730 Physical Chemistry I.....................................3
CHEM 3740 Physical Chemistry II....................................3
CHEM 4300 Instrumental Analysis....................................2
CHEM 4880 Advanced Laboratory III................................2
ECON 4750 Health Economics.........................................3
MBC 4390 Genes and Proteins in Therapy...........................2
MBC 4450 New Drug Development....................................2
PHCL 4140 Interpretation of Pharmaceutical Data..................3
PHCL 4850 Drug Disposition............................................2

*Taught every other year for those undergraduates not planning to apply to UT’s industrial pharmacy graduate program.

Pharmacology/Toxicology Major (PTOX) Major

Pharmacology and Toxicology are biomedical sciences that study how to develop safe, effective drugs and prevent the harmful effects of chemicals. Pharmacology focuses on the way drugs interact with various living systems, including the properties, effects and mechanisms of drug action. Toxicology focuses on the interaction of toxic compounds in the body, including exposure assessment, dose response assessment and hazard identification.

Career Opportunities: This major prepares students to work as a pharmacologist and toxicologist in the biomedical industry, pharmaceutical industry, nutritional industries, environmental conservation and pollution control, scientific civil service, governmental agencies, forensic sciences and research institutes. Graduates can also work as sales representatives or move on to graduate studies in the field, medicine, veterinary medicine and in most biomedical fields.

PTOX Professional Division Curriculum

Third Year

First Semester

MBC 3310 Medicinal Chemistry I....................................3
MBC 3550 Physiological Chemistry I................................3
PHCL 3700 Pharmacology I..........................................3
Major Elective ( Recommend PHCL 4730) 3..........................3
Major Electives (Recommend BIOL 3010 & 3020) 3.................5-6

---

1 To be chosen from the Pharmaceutics Electives list below.
2 To be chosen from the General Electives list below.
3 Suggested sequence
Second Semester

MBC 3320 Medicinal Chemistry II ..........................3
MBC 3560 Physiological Chemistry II .......................3
PHCL 3720 Pharmacology II ..................................3
PHCL 3810 Pharmacology & Toxicology Lab* .................1
Major Elective (Recommend PHCL 4750) ..................3
UT Core Requirement (Multicultural Studies)* ...............3

Fourth Year

First Semester

MBC 4710 Targeted Drug Design (fall) ...................... or
MBC 4720 Advances in Drug Design (spring) ...............3
PHCL 4700 Pharmacology III ................................3
Major Elective 1 ..............................................3
Major Elective 2 ..............................................3
Major Elective 3 ..............................................3
Major Elective 4 ..............................................3

Second Semester

PHCL 4780 Practicum in Pharmacology/Toxicology 1 ..... 6-12

1 To be chosen with faculty adviser from the PTOX Electives list.
2 Required for practicum and only offered in spring.
3 If the practicum is completed in the summer before the 4th year, student can graduate a semester earlier.

* Suggested sequence

PTOX Electives

A total of 24 hours of course work must be selected from the list of elective courses below.

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<td>Cell Biology</td>
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<td>BIOL 4050</td>
<td>Immunology</td>
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<td>Contemporary Natural Remedies</td>
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<td>Nutrition in Health and Disease</td>
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<td>Advances in Drug Design</td>
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<td>Biochemical Toxicology</td>
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<td>Molecular Modeling in Drug Design</td>
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<td>Medicinal Biotech Lab</td>
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<td>PHCL 4140</td>
<td>Interpretation of Pharmaceutical Data</td>
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<td>Pharmacology - Toxicology Seminar</td>
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<td>Toxicological Risk Assessment</td>
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<td>PHCL 4800</td>
<td>Human-Xenobiotic Interactions</td>
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<td>Drug Disposition</td>
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<tr>
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<td>Hrs Seminar Pharmacology/Toxicology</td>
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<td>Problems in Pharmacology/Toxicology</td>
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<tr>
<td>PHCL 4960</td>
<td>Honors Thesis Pharmacology/Toxicology</td>
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</table>

Pharmacy Administration (PHAM) Major

Pharmacy Administration focuses on the corporate and managerial aspects of the pharmacy profession. Students earn a minor in business administration, or professional sales, or both in addition to the B.S.P.S. degree. The business minor options under this major are: business administration minor option; professional sales minor option; business administration minor and professional sales minor option; business administration minor and M.B.A. track option; and professional sales/business administration minor and M.B.A. track option. With one year of additional graduate study, students in the two M.B.A. track options could receive a master of business administration degree.

Career Opportunities: Pharmaceutical sales is one of the fastest growing careers in the country. The pharmacy administration major prepares students for careers in pharmaceutical sales, and management positions in the pharmaceutical industry, corporate and retail pharmacy offices, pharmacy education, government agencies and health care administration. Students are encouraged to pursue graduate studies in business or pharmacy administration.

PHAM Professional Division Curriculum:

There are five options for this major.

Business Administration Minor Option

Third Year

First Semester

BUAD 1020 or CMPT 1100 or placement 1 ..................0-3
BUAD 2060 or MATH 2630 or 2600 or equiv. ...............3
ECON 1150 Principles of Macroeconomics ..................3
MBC 3310 Medicinal Chemistry I ............................3
MBC 3550 Physiological Chemistry I ........................3
PHCL 3700 Pharmacology I ..................................3

Second Semester

BUAD 2040 Financial Acct. Info. 2 ..........................3
BUAD 3010 Principles of Marketing 2 .......................3
MBC 3320 Medicinal Chemistry II .........................3
MBC 3560 Physiological Chemistry II .....................3
PHCL 3720 Pharmacology II ..................................3

Summer between Third and Fourth Year

PHPR 4780 Practicum in Pharmacy Administration ..........6-12

Fourth Year

First Semester

BUAD 2050 Acct. for Bus. Decision-making 2 ............3
BUAD 3030 Manage. & Behav. Process in Orgs 2 ............3
BUAD 3040 Prin. of Financial Management 2 ..............3
PHCL 4700 Pharmacology III ................................3
### Professional Sales Minor Option

**Third Year**

**First Semester**
- BUAD 2060 or MATH 2630 or 2600 or equiv. .................................................. 3  
- ECON 1150 Principles of Macroeconomics ...................................................... 3  
- MBC 3310 Medicinal Chemistry I ................................................................. 3  
- MBC 3550 Physiological Chemistry I ............................................................. 3  
- PHCL 3700 Pharmacology I .............................................................................. 3  

**Second Semester**
- BUAD 2040 Financial Acct. Info. ................................................................. 3  
- BUAD 3010 Principles of Marketing ............................................................... 3  
- MBC 3320 Medicinal Chemistry II ................................................................. 3  
- MBC 3560 Physiological Chemistry II ........................................................... 3  
- PHCL 3720 Pharmacology II ........................................................................... 3

**Summer between Third and Fourth Year**
- PHPR 4780 Practicum in Pharmacy Administration .......................6-12

### Fourth Year

**First Semester**
- BUAD 2050 Acct. for Bus. Decision-Making .............................................. 3  
- BUAD 3030 Manage. & Behav. Process Orgs. .................................................. 3  
- PHCL 4700 Pharmacology III ........................................................................... 3  
- PSLS 3440 Sales ....................................................................................... 3  
- PSLS 3450 Account & Territory Management ................................................. 3

**Second Semester**
- BUAD 3040 Prin. of Financial Management .............................................. 3  
- PHPR 4550 Analysis of Pharm. Environment .................................................. 3  
- PSLS 3080 Purch. & Busi. Rela. Mgmt ............................................................... 3  
- PSLS 4710 Sales Force Leadership ................................................................. 3  
- PSLS 4740 Advanced Sales ............................................................................ 3

**Non-western Multicultural Studies* (IBUS 3150) .................................... 3  

1. A grade of C or higher is required for the minor.
2. Placement test, which is available at www.business.utoledo.edu.
3. If IBUS 3150 is not taken for non-western multicultural studies, students should take BUAD 2070 for the double minors.
4. * Suggested sequence

### Business Administration Minor & M.B.A. Track Option

**Third Year**

**First Semester**
- BUAD 1020 or CMPT 1100 or placement ................................................. 0-3  
- BUAD 3030 Manage. & Behav. Process Orgs. .................................................. 3  
- ECON 1150 Principles of Macroeconomics ...................................................... 3  
- MBC 3310 Medicinal Chemistry I ................................................................. 3  
- MBC 3550 Physiological Chemistry I ............................................................. 3  
- PHCL 3700 Pharmacology I .............................................................................. 3

**Second Semester**
- BUAD 2040 Financial Acct. Info. ................................................................. 3  
- BUAD 2060 or MATH 2630 or 2600 or equiv. .................................................. 3  
- MBC 3320 Medicinal Chemistry II ................................................................. 3  
- MBC 3560 Physiological Chemistry II ........................................................... 3  
- PHCL 3720 Pharmacology II ........................................................................... 3

**Summer between Third and Fourth Year**
- PHPR 4780 Practicum in Pharmacy Administration .......................6-12

### Fourth Year

**First Semester**
- BUAD 2050 Acct. for Bus. Decision-Making .............................................. 3  
- BUAD 2070 Appl. of Stats in Bus. Decli. Making .............................................. 3  
- BUAD 3010 Principles of Marketing ............................................................... 3  
- PHCL 4700 Pharmacology III ........................................................................... 3
Second Semester

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<tr>
<td>BUAD 3020</td>
<td>Principles of Mfg. &amp; Service Systems</td>
<td>3</td>
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<tr>
<td>BUAD 3040</td>
<td>Prin. of Financial Management</td>
<td>3</td>
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<tr>
<td>PHPR 4550</td>
<td>Analysis of Pharm. Environment</td>
<td>3</td>
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<tr>
<td>PHPR 4520</td>
<td>Pharmacy Management &amp; Marketing</td>
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<tr>
<td>MKTG 3880</td>
<td>Mkgt. Rsch. &amp; Data-Based Mgmt.</td>
<td>3</td>
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<tr>
<td>MKTG 4540</td>
<td>Business Marketing</td>
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<tr>
<td>UT Core Requirement (Multicultural Studies)*</td>
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</table>

1. This track will enable students to fulfill the prerequisites for the M.B.A. program with grades of C (2.0) or higher in all BUAD courses listed in this curriculum. To be admitted to the M.B.A. program in the College of Business Administration, students must successfully complete the GMAT prior to application. Students who have satisfied all graduate admissions requirements and prerequisites will complete 33 semester hours at the 6000 graduate level for the M.B.A. at The University of Toledo.

2. This requirement will be waived with a passing score on the Microcomputer Placement Test, which is available at www.business.utoledo.edu.

* Suggested sequence

**Professional Sales/Business Administration Minors and M.B.A. Track Option**

**Third Year**

**First Semester**

<table>
<thead>
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<tr>
<td>BUAD</td>
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<td>CMPT</td>
<td>Principles of Macroeconomics</td>
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<td>MBC</td>
<td>Medicinal Chemistry I</td>
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**Second Semester**

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<tr>
<td>BUAD</td>
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<tr>
<td>BUAD</td>
<td>Principles of Marketing</td>
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<tr>
<td>MBC</td>
<td>Medicinal Chemistry II</td>
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<td>MBC</td>
<td>Physiological Chemistry II</td>
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**Summer between Third and Fourth Year**

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<tr>
<td>PHPR 4780</td>
<td>Practicum in Pharmacy Administration</td>
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**Fourth Year**

**First Semester**

<table>
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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>BUAD 2050</td>
<td>Acct. for Bus. Decision-making</td>
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<tr>
<td>BUAD 2070</td>
<td>Appl. of Stats in Bus Decision-making</td>
<td>3</td>
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<tr>
<td>PHCL 4700</td>
<td>Pharmacology III</td>
<td>3</td>
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<tr>
<td>PSLS 3440</td>
<td>Sales</td>
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<tr>
<td>PSLS 3450</td>
<td>Acct. &amp; Territory Management</td>
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**Second Semester**

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<tr>
<td>BUAD 3040</td>
<td>Prin. of Financial Management</td>
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<tr>
<td>PHPR 4550</td>
<td>Analysis of Pharm. Environment²</td>
<td>3</td>
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<tr>
<td>PSLS 3080</td>
<td>Purch. &amp; Busi. Rela. Mgmt.</td>
<td>3</td>
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<tr>
<td>PSLS 4710</td>
<td>Sales Force Leadership</td>
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<tr>
<td>PSLS 4740</td>
<td>Advanced Sales</td>
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<td>UT Core Requirement (Multicultural Studies)*</td>
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</table>

3. This track will enable students to fulfill most of the prerequisites for the M.B.A. program, except one course BUAD 3020, with grades of C (2.0) or higher in all BUAD and PSLS courses listed in this curriculum. To be admitted to the M.B.A. program in the College of Business Administration, students must successfully complete the GMAT prior to application. Students who have satisfied all graduate admissions requirements and prerequisites will complete 33 semester hours at the 6000 graduate level for the M.B.A. at The University of Toledo.

2. This requirement will be waived with a passing score on the Microcomputer Placement Test, which is available at www.business.utoledo.edu.

* Suggested sequence

**Note:** The student is responsible for the correct selection of the program of study each semester and for the fulfillment of the requirements given here. Although advisers will assist wherever possible, the final responsibility rests with the student. The College of Pharmacy reserves the right to change its policies and procedures at any time. These changes will be binding on the date they are approved by faculty action. Courses taken at other colleges of pharmacy will not substitute for professional division pharmacy courses. The only pharmacy courses a preprofessional student is permitted to take through the College of Pharmacy are PHPR 1000, PHPR 2010, PHCL 2600 and PHCL 2620. Only students admitted to the professional division will be allowed to take 3000- or 4000-level courses in the college.

**Doctor of Pharmacy Degree Requirements**

Following admission to the professional division, the entry-level Pharm.D. program students will complete a B.S.P.S. prior to admission to the graduate portion of the program. Students in the entry-level Pharm.D. track who have completed the B.S.P.S. at The University of Toledo with a 3.0 GPA for their professional division courses are eligible for admission to the graduate portion of the Pharm.D. program.

A formal predidmission decision to the graduate portion of the Pharm.D. program will be made at the end of the fall of the fourth year while in the professional division. The final decision is contingent upon completion of the B.S.P.S. degree, normally with a minimum GPA of 3.0 in third and fourth year pharmacy courses. In order to graduate with the doctor of pharmacy degree, students must maintain a minimum of a 3.0 GPA with no grade lower than a C (2.0) in graduate courses as required for all graduate students.

Only students who successfully complete the Pharm.D. degree will qualify for state board licensure in the practice of pharmacy.

A total of 137 semester hours is required for graduation with the B.S.P.S. - Pharm.D. track degree. Eligible students then may matriculate into the graduate portion of the Pharm.D. degree (see above statement). The curriculum is outlined below.

**First Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>BIOL 2150</td>
<td>Fundamentals of Life Sci. I</td>
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<td>BIOL 2160</td>
<td>Fundamentals of Life Sci. Lab I</td>
<td>1</td>
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<tr>
<td>CHEM 1230</td>
<td>General Chemistry I</td>
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<td>CHEM 1280</td>
<td>General Chemistry Lab I</td>
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<tr>
<td>MATH 1750</td>
<td>Mathematics for the Life Sci. I</td>
<td>4</td>
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<tr>
<td>PHPR 1000</td>
<td>Orientation</td>
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<tr>
<td>UT Core Requirement (ENG 1110)*</td>
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</table>
Second Semester
BIOL 2170 Fundamentals of Life Sci. II .............................................. 4
BIOL 2180 Fundamentals of Life Sci. Lab II ............................................... 1
CHEM 1240 General Chemistry II ................................................................. 4
CHEM 1290 General Chemistry Lab II ........................................................... 1
MATH 1760 Mathematics for the Life Sci. II ................................................. 3
UT Core Requirement (ENG 1130 or equivalent)* ....................................... 3

Second Year
First Semester
CHEM 2410 Organic Chemistry I ................................................................. 3
CHEM 2460 Organic Chemistry Lab I ............................................................. 1
PHCL 2600 Funct. Anat. & Pathophysiology I .............................................. 4
PHPR 2010 Intro to Patient Care .................................................................. 2
PHYS 1750 Introduction to Physics or equiv. ................................................. 3
UT Core Requirement (PSY 1010 or SOC 1010)* ......................................... 3

Second Semester
CHEM 2420 Organic Chemistry II ............................................................. 3
CHEM 2470 Organic Chemistry Lab II ......................................................... 1
PHCL 2620 Funct. Anat. & Pathophysiology II ......................................... 4
UT Core Requirement (ECON 1200)* ........................................................... 3
UT Core Requirement (Humanities/Fine Arts)* ........................................... 3
UT Core Requirement (Humanities/Fine Arts)** ......................................... 3

* Suggested sequence
** Select a course that will simultaneously fulfill a UT Multicultural Studies Core Curriculum requirement.

Third Year
First Semester
MBC 3310 Medicinal Chemistry I ................................................................. 3
MBC 3550 Physiological Chemistry I ............................................................ 3
PHCL 3700 Pharmacology I ................................................................. 3
PHPR 3010 Pharmaceutical Calculations ..................................................... 2
PHPR 3070 Pharmaceutics I ................................................................. 4
PHPR 3510 Pharmaceutics Dimensions of Hlth Care Sys ................................ 3

Second Semester
MBC 3320 Medicinal Chemistry II ............................................................ 3
MBC 3560 Physiological Chemistry II .......................................................... 3
MBC 3800 Microbiology & Immunology ....................................................... 3
MBC 3850 Microbiology & Immunology Lab .............................................. 1
PHCL 3720 Pharmacology II ................................................................. 3
PHPR 3080 Pharmaceutics II ......................................................................... 4
PHPR 3940 Early Practice Development* .................................................... 1

Fourth Year
First Semester
MBC 4300 Medicinal Chemistry III .............................................................. 3
PHCL 4150 Biopharmaceutics & Pharmacokinetics ...................................... 4
PHCL 4700 Pharmacology III ................................................................. 3
PHPR 3940 Early Practice Development* .................................................... 1
PHPR 4400 Human Interaction in Healthcare .............................................. 2
PHPR 4410 Professional Practice Development I ......................................... 3
PHPR 4430 Pathophysiology and Pharmacotherapy (PPT): Introduction .......... 1

Second Semester
PHCL 4720 Pharmacology IV ................................................................. 3
PHPR 4420 Professional Practice Development II ........................................ 3
PHPR 4440 PPT: Immunology .................................................................. 2
PHPR 4450 PPT: Renal ............................................................................ 3
PHPR 4520 Pharmaceutics Management and Marketing ................................. 3
UT Core requirement (Humanities/Fine Arts) ................................................ 3

Note: At the end of the fourth year, students are candidates for a B.S. degree in pharmaceutical sciences leading toward a Pharm.D. degree.

Subsequent Graduate Courses in the Pharm.D. Program

First Semester: Summer between Fourth and Fifth Year
PHCL 5140 Interpretation of Pharm. Data .................................................... 2
PHPR 6210 Introduction to Research Methods .............................................. 2
PHPR 6940 Early Practice Exposure ......................................................... 2
(PHPR 6940 will consist of 80 hours of pharmacy practice)

Second Semester: Fall Semester-Fifth Year
PHPR 6160 Advanced Applied Pharmacokinetics ......................................... 3
PHPR 6230 Patient Care Rounds I ............................................................... 3
PHPR 6420 PPT: Cardiology ....................................................................... 4
PHPR 6430 PPT: Pulmonary ....................................................................... 3
PHPR 6440 PPT: Infectious Disease ............................................................. 4

Third Semester: Spring Semester-Fifth Year
PHPR 6240 Patient Care Rounds II ............................................................. 3
PHPR 6250 Self Care .................................................................................. 3
PHPR 6370 PPT: Nutrition ......................................................................... 1
PHPR 6490 PPT: Hematology/Oncology ..................................................... 3
PHPR 6510 PPT: Poison Management ....................................................... 1
PHPR 6550 Management Topics for Clinical Practice ................................ 2
PHPR 6610 Seminar I ............................................................................... 1
PHPR 8390 PPT: Gastroenterology ............................................................. 2
Graduate Professional Electives ................................................................. 2

Fourth Semester: Summer between Fifth and Sixth Year
PHPR 6830 PPT: Endocrinology ................................................................. 2
PHPR 8260 Jurisprudence & Ethics for Pharmacy ......................................... 1
PHPR 8470 PPT: Rheumatology ................................................................. 1
PHPR 8480 PPT: Neurology and Psychiatry ................................................ 3
PHPR 8500 PPT: Geriatrics and Pediatrics .................................................... 3
PHPR 8620 Seminar II ............................................................................... 1
PHPR 8640 PPT: Capstone ......................................................................... 2
Graduate Professional Electives ................................................................. 3

Fifth Semester: Fall Semester-Sixth Year
PHPR 8630 Seminar III .............................................................................. 2
PHPR 8940:001 Clinical Clerkship I ............................................................... 4
PHPR 8940:002 Clinical Clerkship II ............................................................ 4
PHPR 8940:003 Clinical Clerkship III ............................................................ 4
PHPR 8940:004 Clinical Clerkship IV ............................................................ 4

Sixth Semester: Spring Semester-Sixth Year
PHPR 8940:005 Clinical Clerkship V ............................................................ 4
PHPR 8940:006 Clinical Clerkship VI ............................................................ 4
PHPR 8940:007 Clinical Clerkship VII ............................................................ 4
PHPR 8940:008 Clinical Clerkship VIII ............................................................ 4

Note: At the end of the sixth year, students are candidates for a Pharm. D. degree.

Pharm.D. Graduate Professional Electives

The following is a list of recommended professional electives. Other electives may be chosen with the written approval of a faculty adviser.

MBC
MBC 5100/ Research Practices in Medicinal Chemistry .................................. 1
MBC 5380 Medicinal & Poisonous Plants ..................................................... 3
MBC 5620/ Biochemical Techniques .............................................................. 2
MBC 7620/
### College of Pharmacy

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<th>Credit Hours</th>
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<tr>
<td>MBC 6100/6100</td>
<td>Advanced Immunology</td>
<td>2</td>
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<tr>
<td>MBC 6190/6190</td>
<td>Advanced Medicinal Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>MBC 6200/6200</td>
<td>Biomedical Chemistry</td>
<td>4</td>
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<tr>
<td>MBC 6420/6420</td>
<td>Protein Chemistry/CHEM 6510/8510</td>
<td>2 or 4</td>
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<tr>
<td>MBC 6430/6430</td>
<td>Nucleic Acid Chemistry/CHEM 6530/8530</td>
<td>2 or 4</td>
</tr>
<tr>
<td>MBC 6440/6440</td>
<td>Enzymology/CHEM 6520/8520</td>
<td>2 or 4</td>
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<tr>
<td>MBC 6750/6750</td>
<td>Bioorganic Chemistry: Chemical</td>
<td>3</td>
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<tr>
<td>MBC 6800/6800</td>
<td>Methods in Biotechnology</td>
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#### PHCL

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<td>PHCL 5300</td>
<td>Selected Topics in Pharmacology</td>
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<td>PHCL 5730</td>
<td>Toxicology I</td>
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<tr>
<td>PHCL 5750</td>
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<td>PHCL 5760</td>
<td>Toxicokinetics</td>
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<td>PHCL 5900</td>
<td>Drug Disposition</td>
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<td>PHCL 5990</td>
<td>Problems in Pharmacology</td>
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<td>PHCL 6150</td>
<td>Advanced Pharmacokinetics</td>
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<td>PHCL 6600</td>
<td>Seminar in Pharmacology</td>
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<tr>
<td>PHCL 6770</td>
<td>Toxicological Risk Assessment</td>
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#### PHPR - Administration

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<tr>
<td>PHPR 5990</td>
<td>Problems in Pharmacy Practice</td>
<td>1 to 6</td>
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<tr>
<td>PHPR 6530</td>
<td>Research Methods in Pharmacy Practice</td>
<td>3</td>
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<tr>
<td>PHPR 6600</td>
<td>Seminar in Administrative Pharmacy</td>
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<td>PHPR 6810</td>
<td>Hospital Pharmacy Administration</td>
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<td>PHPR 6820</td>
<td>Selected Topics in Hospital Pharmacy</td>
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<tr>
<td>PHPR 6830</td>
<td>Advanced Community Pharmacy Administration</td>
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<td>PHPR 6840</td>
<td>Selected Topics in Community Pharmacy</td>
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<td>PHPR 6980</td>
<td>Special Topics</td>
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#### PHPR - Industrial

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<td>Parenteral Manufacturing</td>
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<td>PHPR 5690</td>
<td>Dosage Form Design</td>
<td>3</td>
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<tr>
<td>PHPR 5710</td>
<td>Selected Topics in Pharmaceutical Technology</td>
<td>2 to 3</td>
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<tr>
<td>PHPR 5720</td>
<td>Pharmaceutical Rate Processes</td>
<td>3</td>
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<tr>
<td>PHPR 5990</td>
<td>Problems in Pharmacy Practice</td>
<td>1 to 6</td>
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<tr>
<td>PHPR 6950</td>
<td>Seminar in Industrial Pharmacy</td>
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<tr>
<td>PHPR 6980</td>
<td>Special Topics</td>
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#### PHPR - Clinical

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<tr>
<td>PHPR 6800</td>
<td>Monitoring Therapy</td>
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<tr>
<td>PHPR 6980</td>
<td>Special Topics</td>
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</table>
College of Pharmacy Faculty

Department of Medicinal and Biological Chemistry

Paul W. Erhardt, 1994, professor
B.A., Ph.D., University of Minnesota

Max O. Funk, 1987*, professor
B.S., Pennsylvania State University; Ph.D., Duke University

Stephen L. Goldman, 1987*, professor
A.B., Brooklyn College; M.S., Ph.D., University of Missouri

Ezdihar A.M. Hassoun, 1995*, associate professor
B.Sc. Pharm., University of Baghdad; Ph.D., University of Uppsala, Sweden

Channing L. Hinman, 1985, associate professor
B.S., Brigham Young University; Ph.D., University of California - Los Angeles

Wayne P. Hoss, 1985, professor and executive associate dean
B.S., University of Idaho; Ph.D., University of Nebraska

Richard A. Hudson, 1985, professor
B.A., Kalamazoo College; Ph.D., University of Chicago

Jon R. Kirchhoff, 1997*, professor
B.A., State University of New York - Cortland; Ph.D., Purdue University

Richard W. Komuniecki, 1997*, professor
A.B., Holy Cross College; M.S., Ph.D., University of Massachusetts

Marcia F. McInerney, 1991, professor and interim chair
B.A., University of Connecticut; M.S., Case Western University; Ph.D., University of Michigan

William S. Messer Jr., 1985, professor
B.S., Springfield College; M.S., Ph.D., University of Rochester

Steven M. Peseckis, 1994, associate professor
B.S., Dartmouth College; Ph.D., Massachusetts Institute of Technology

A. Alan Pinkerton, 1987*, professor
R.I.C., Brighton College of Technology; Ph.D., University of Alberta

Joseph Schradie, 1965, professor emeritus
Pharm.D., M.S., Ph.D., University of Southern California; R.Ph.

James T. Slama, 1991, associate professor
A.B., Cornell University; Ph.D., University of California

Hermann von Grafenstein, 2002, associate professor
M.S., M.D., Ludwig Maximilian University, Ph.D., Max Planck Institute of Biochemistry, Munich and the University of Konstanz

Katherine A. Wall, 1991, professor
B.S., Montana State University; Ph.D., University of California

ASSOCIATED FACULTY

Graham J. Durant, 1987, adjunct professor
B.S., Ph.D., Birmingham University

Wieslaw Klis, 2001, research assistant professor
Ph.D., University of Wroclaw

Sonja Najjar, 2002, adjunct professor
Ph.D., Stanford University

Peter Nagy, 1991, research associate professor
Ph.D., Lorand Eotvos University of Sciences

Jeffrey Sarver, 2001, research assistant professor
Ph.D., The University of Toledo

L.M.V. Tillekeratne, 1991, research professor
D.Phil., Oxford University

Department of Pharmacology

Kenneth A. Bachmann, 1973, professor
B.S. Pharm., Ph.D., The Ohio State University; R.Ph.

James Byers, 1998, assistant professor
B.S.Ch.E, University of Maryland; M.S.Ch.E, Ph.D, The University of Toledo

Johnnie L. Early II, 2000, professor and dean
B.S. Pharm., Mercer University; M.S., Ph.D., Purdue University; R.Ph.

Robert B. Forney, 1981*, associate professor (Medical College of Ohio and The University of Toledo)
A.B., Ph.D., Indiana University

Alan G. Goodridge, 2003*, professor
B.S., Tufts University; M.S., Ph.D., University of Michigan

Miles Hacker, 2002, professor
B.S., Murray State University; Ph.D., University of Tennessee

Ezdihar A.M. Hassoun, 1995, associate professor
B.Sc. Pharm., University of Baghdad; Ph.D., University of Uppsala, Sweden

Christine N. Hinko, 1979, professor and associate dean for student affairs
B.A., Clarion State College; Ph.D., The Ohio State University

William S. Messer Jr., 1985, professor and chair
B.S., Springfield College; M.S., Ph.D., University of Rochester

Robert J. Schlembach, 1954, professor emeritus
B.S. Pharm., The University of Toledo; M.Sc., Ph.D., Purdue University; R.Ph.

Gerald P. Sherman, 1978, professor
B.Sc. Pharm., M.Sc., Ph.D., Philadelphia College of Pharmacy and Science; R.Ph.
Hermann von Grafenstein, 2002*, associate professor  
M.S., M.D., Ludwig Maximilian University; Ph.D., Max Planck Institute of Biochemistry, Munich and the University of Konstanz

Donald B. White, 1995*, professor  
B.S., University of California - Los Angeles; M.S., Ph.D., University of California - Irvine

Fred E. Williams, 2002, assistant professor  
B.S., University of Michigan; M.H.S., Grand Valley State University. Ph.D., Medical College of Ohio

* Joint appointment

ASSOCIATED FACULTY

David E. Albert, 1996, adjunct assistant professor  
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Department of Pharmacy Practice

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