COLLEGE OF PHARMACY

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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 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 (third year) is competitive.

The program of study leading to pharmacy licensure for entering freshmen is the entry-level doctor of pharmacy (Pharm.D.). Students who have already completed a bachelor of science in pharmacy 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 to prepare students for a variety of careers in the pharmaceutical and biotechnological industries. Students seeking the 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 bachelor of science in pharmaceutical sciences degree will not prepare students for state board licensure, nor will it prepare students to practice pharmacy.

Pharmacy Graduate Degree Programs
The College of Pharmacy offers several nonlicensure 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
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 bachelor of science in pharmaceutical sciences program. For the entry-level Pharm.D. and the four-year bachelor of science in pharmaceutical sciences programs, the College of Pharmacy limits student enrollment into the professional division (third year) in accordance with its facilities.

Contingent Admission
A small group of academically exceptional high school graduates may be offered contingent admission to the professional division of the Pharm.D. or the bachelor of science in pharmaceutical sciences programs. Automatic admission to the third year of the curriculum will be contingent on successful completion of the first and second preprofessional years, while maintaining specific scholastic standards.

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 (GPA) of at least 2.7 (this is based on all letter grades attained at all institutions of higher learning and uses the point average scale of A equaling 4 points), 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 to 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 higher education 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 nonreturnable 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. Highly qualified students who will have earned bachelor degrees and will have met all prerequisites may be reviewed for admission directly to the professional division of the Pharm.
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 and 2180
- CHEM 1230, 1240, 1280, 1290, 2410 and 2460
- MATH 1750
- PHCL 2600
- PHP 2010
- PHYS 1750 or 2070

- A minimum of 44 earned semester hours
- A minimum 2.7 cumulative 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 bachelor of science in pharmaceutical sciences 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 and 2180
- CHEM 1230, 1240, 1280, 1290, 2410, 2420, 2460 and 2470
- MATH 1750 and 1760
- ECON 1200
- PHCL 2600 and 2620
- PHP 2010
- PHYS 1750 or 2070/2080

- A minimum of 63 earned semester hours
- Maintain a minimum 2.0 GPA (cumulative and semester) for the spring and, if applicable, summer semesters

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 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)
- Personal interview at the discretion of the committee (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
  - PHCL 2600

The admissions committee will use the better 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 on 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 quality hours at The University of Toledo, the higher education GPA will be used in the evaluation in place of the UT cumulative GPA, if the higher education GPA value is less than the UT cumulative GPA. If the higher education GPA is greater than the UT cumulative GPA, the latter will be used.

Transfer Students
Specific criteria have been approved by the faculty of the College of Pharmacy for the application of transfer students or of change-of-college students to 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, personal interview (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 higher education GPA (as described previously), science GPA based on equivalent specified courses (UT or otherwise) as stated above, personal essay and personal interview (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 previously. 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 and 2010 and PHCL 2220, 2600 and 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 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 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 course work (required and elective courses) during the first two years of the curriculum.

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

The bachelor of science in pharmaceutical sciences 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 minimum cumulative GPA of 3.3. In addition, at least five hours of the 33 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 also is available to students who are not members of the University Honors Program, but who meet departmental honors requirements. These departmental honors requirements are a GPA of 3.2 or higher and completion of eight hours of honors course work in one department, including the honors thesis and seminar.

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 in which 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 in accordance with the University’s Missed Class Policy.

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 Polices 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 developmental math). These seven P/NC hours are applicable only to courses in 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 also to patients. 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 an 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 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 GPAs 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 of less than 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 will be allowed, in accordance with the policies of The University of Toledo.

For all undergraduate students in the preprofessional division and in the professional division of the bachelor of science in pharmaceutical sciences, pharmacology/toxicology, medicinal and biological chemistry, pharmaceutics, and pharmacy administration majors in the College of Pharmacy:

a) Any student who fails to achieve a semester or cumulative GPA of 2.0 or greater at the end of any semester will automatically be placed on probation.

b) Any student who fails to achieve a semester or cumulative GPA of 1.0 or greater at the end of any semester will automatically be placed on probation, will undergo a record review by the College of Pharmacy Academic Performance Committee, and may be suspended (see section on suspension below) from the University without a preliminary probationary semester.

c) Any student who fails to achieve a semester or cumulative GPA of 2.0 or greater for any two of three consecutive semesters in attendance will undergo a record review by the College of Pharmacy Academic Performance Committee, and may be suspended (see section on suspension below) from the University.

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

a) Students must maintain a minimum GPA of 3.0. This GPA will be computed beginning from the first semester of the post-bachelor of science in pharmaceutical sciences course work and will include all graduate-level courses (see below). 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 academic standing,” as defined below.

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 re-enroll. 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 academic 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 bachelor of science in pharmaceutical sciences program (pharmacology/toxicology, medicinal and biological chemistry, pharmaceutics and pharmacy administration majors): a minimum cumulative GPA of 2.0 and a minimum GPA of 2.0 for the semester.

b) For all professional division students in the Pharm.D. program: a minimum cumulative pharmacy core-curriculum GPA of 3.0 and a minimum 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:

- MBC 3310, 3320, 3550, 3560, 3800, 3850 and 4300
- PHCL 3700, 3720, 4150, 4700 and 4720
- PHPR 3010, 3070, 3080, 3510, 3940, 4400, 4410, 4420, 4430, 4440, 4450 and 4520

Post-B.S.P.S. core-curriculum courses taught in the College of Pharmacy beginning in the first year of the post-bachelor of science in pharmaceutical sciences portion of the program:

- PHCL 5140
- PHPR 6160, 6210, 6230, 6240, 6250, 6370, 6380, 6420, 6430, 6440, 6490, 6510, 6550, 6610, 6940, 8260, 8390, 8470, 8480, 8500, 8620 and 8630

Experiential Performance Standards
Any student who fails to pass a single clerkship rotation or is dismissed from a single clerkship rotation (for reasons other than an action detrimental to patient care and/or to the clinical service) will be placed on academic probation immediately upon completion or dismissal from the rotation. The student will continue on academic probation for the duration of his/her clerkship rotation experience.

Any student on probation who fails to pass a clerkship rotation or is dismissed from a clerkship rotation will be immediately removed from the clerkship program, receive a record review by the academic performance committee, and be subject to dismissal from the doctor of pharmacy program. All previously scheduled clerkship sites will become available for other clerkship students.

If the situation leading to the dismissal of a student from a clerkship rotation is related to an action that is detrimental to patient care and/or the clinical service, the student will be immediately removed from the clerkship program. The academic performance committee will review the situation, and the student may be subject to dismissal from the doctor of pharmacy program. All previously scheduled clerkship sites will become available for other clerkship students.

Actions that are subject to dismissal are outlined in the Experiential Dismissal Policy.

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 UT 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 (Wolfe Hall Room 1227) in care of the associate dean for student affairs. 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: www.acpe-accredit.org/standards/default.asp.

Student issues or complaints regarding specific courses should be resolved via discussion with the course instructor. If further resolution is required, the departmental 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 in the College of Pharmacy

<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>
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<tr>
<td>Second</td>
<td>Earned at least 30 semester hours, have a higher education GPA</td>
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<td></td>
<td>(as previously defined) of 2.5 or greater (based on the point average scale of A equaling 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>
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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 and 2010, and PHCL 2220, 2600 and 2620. Only students admitted to the professional division will be allowed to take 3000- or 4000-level courses in the college.

Degree Requirements
The curriculum as outlined in the current catalog is subject to modifications with immediate implementation to keep pace with changing trends in pharmaceutical education and in accordance with accreditation standards.

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 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. 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 bachelor of science in pharmaceutical sciences non-Pharm.D. majors.

Preprofessional Division Requirements
In the preprofessional division, the first two years of the bachelor of science in pharmaceutical sciences 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 bachelor of science in pharmaceutical sciences degrees.

First Year

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<tr>
<th>Course</th>
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<tr>
<td>BIOL 2150</td>
<td>Fundamentals of Life Sci. I</td>
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<tr>
<td>BIOL 2160</td>
<td>Fundamentals of Life Sci. Lab I</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>Calculus for the Life Sciences I</td>
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<td>PHPR 1000</td>
<td>Orientation</td>
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<td>UT Core Requirement (ENGL 1110)*</td>
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Second Year

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<td>CHEM 2410</td>
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<td>CHEM 2460</td>
<td>Organic Chemistry Lab I</td>
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<tr>
<td>PHCL 2600</td>
<td>Funct. Anat. &amp; Pathophysiology I</td>
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<tr>
<td>PHPR 2010</td>
<td>Intro to Patient Care</td>
<td>2</td>
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<tr>
<td>PHYS 1750</td>
<td>Introduction to Physics or equiv</td>
<td>4</td>
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<tr>
<td>UT Core Requirement (PSY 1010 or SOC 1010)*</td>
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</tr>
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</table>

* Suggested sequence
** Select a course that will simultaneously fulfill a UT multicultural studies Core Curriculum requirement.

Bachelor of Science in Pharmaceutical Sciences Professional Division Requirements
In the professional division of the bachelor of science in pharmaceutical sciences degree program, the last two years of the program, advanced courses of study and 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 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 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 also are able to move on to graduate programs in the field, medical school or other professional schools.

**Medicinal and Biological Chemistry Professional Division Curriculum**

**Third Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 3310</td>
<td>Medicinal Chemistry I</td>
<td>3</td>
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<tr>
<td>MBC 3550</td>
<td>Physiological Chemistry I</td>
<td>3</td>
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<tr>
<td>or</td>
<td>CHEM 3510</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>PHCL 3700</td>
<td>Pharmacology I</td>
<td>3</td>
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<td>Major Elective (Recommend MBC 3880)</td>
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<tr>
<td>Major Elective (Recommend CHEM 3310)</td>
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**Second Semester**

<table>
<thead>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MBC 3320</td>
<td>Medicinal Chemistry II</td>
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<tr>
<td>MBC 3560</td>
<td>Physiological Chemistry II</td>
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<td>or</td>
<td>CHEM 3520</td>
<td>Biochemistry II</td>
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<td>PHCL 3720</td>
<td>Pharmacology II</td>
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<td>Major Elective (Recommend CHEM 3360)</td>
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<td>Major Elective (Recommend MBC 3880 or CHEM 3720)</td>
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<tr>
<td>UT Core Requirement (Multicultural Studies)*</td>
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**Fourth Year**

**First Semester**

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MBC 4710</td>
<td>Targeted Drug Design (fall)</td>
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<tr>
<td>MBC 4720</td>
<td>Advances in Drug Design (spring)</td>
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<td>Major Elective¹</td>
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**Second Semester**

<table>
<thead>
<tr>
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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 fourth 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.

**Pharmaceutics 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 also can move on to graduate studies in the field, medical school or other professional school.

**Pharmacology/Toxicology 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 pharmacologists and toxicologists 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.

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Third Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHCL 3720</td>
<td>Medicinal Chemistry I</td>
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<tr>
<td>PHCL 3710</td>
<td>Physiological Chemistry I</td>
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<td>PHPR 3700</td>
<td>Pharmacology I</td>
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<tr>
<td>PHPR 3010</td>
<td>Pharmaceutical Calculations</td>
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<tr>
<td>PHPR 3070</td>
<td>Pharmaceuticals I</td>
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</table>

**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 | Pharmaceuticals II | 4 |

**Summer between Third and Fourth Year**

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

**Fourth Year**

<table>
<thead>
<tr>
<th>First Semester</th>
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</thead>
<tbody>
<tr>
<td>CHEM 3310</td>
<td>Analytical Chemistry</td>
</tr>
<tr>
<td>PHCL 4150</td>
<td>Biopharmaceutics &amp; Pharmacokinetics</td>
</tr>
<tr>
<td>PHCL 4700</td>
<td>Pharmacology III</td>
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</table>

**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**

**Pharmacology/Toxicology Professional Division Curriculum**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Third Year</th>
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</thead>
<tbody>
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<td>MBC 3310</td>
<td>Medicinal Chemistry I</td>
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<tr>
<td>MBC 3550</td>
<td>Physiological Chemistry I</td>
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<tr>
<td>PHCL 3700</td>
<td>Pharmacology I</td>
</tr>
<tr>
<td>Major Elective (Recommend PHCL 4730)</td>
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</tbody>
</table>

**Second Semester**

| MBC 3320 | Medicinal Chemistry II | 3 |
| MBC 3560 | Physiological Chemistry II | 3 |
| PHCL 3720 | Pharmacology II | 3 |
| General Electives | 3 |

**Fourth Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Third Year</th>
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<tbody>
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<td>MBC 3550</td>
<td>Physiological Chemistry I</td>
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<tr>
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<td>Pharmacology I</td>
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<tr>
<td>Major Elective (Recommend PHCL 4730)</td>
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</tbody>
</table>

**Second Semester**

| MBC 3320 | Medicinal Chemistry II | 3 |
| MBC 3560 | Physiological Chemistry II | 3 |
| PHCL 3700 | Pharmacology II | 3 |
| Major Elective (Recommend PHCL 4730) | 3 |

**PHAR Electives**

| 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**

**PHAR Electives**

| 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 |

**College of Pharmacy 217**

1 To be chosen from the pharmacology electives list below.
2 To be chosen from the general electives list below.
3 * Suggested sequence

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 fourth year, the 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BIOL 3010</td>
<td>Molecular Genetics</td>
<td>3</td>
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<tr>
<td>BIOL 3020</td>
<td>Molecular Genetics - Lab</td>
<td>2</td>
</tr>
<tr>
<td>BIOL 3030</td>
<td>Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 3040</td>
<td>Cell Biology Lab</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4010</td>
<td>Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4030</td>
<td>Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4050</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4110</td>
<td>Human Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4330</td>
<td>Parasitology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3310</td>
<td>Analytical Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 3360</td>
<td>Analytical Chemistry Lab</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 3710</td>
<td>Physical Chemistry for the Biosciences I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3720</td>
<td>Physical Chemistry for the Biosciences II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3730</td>
<td>Physical Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3740</td>
<td>Physical Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 4300</td>
<td>Instrumental Analysis</td>
<td>2</td>
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<tr>
<td>CHEM 4880</td>
<td>Advanced Laboratory III</td>
<td>2</td>
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<tr>
<td>MATH 2600</td>
<td>Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3800</td>
<td>Microbiology &amp; Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MBC 4300</td>
<td>Chemotherapy and Immunotherapy</td>
<td>3</td>
</tr>
<tr>
<td>MBC 4340</td>
<td>Contemporary Natural Remedies</td>
<td>2</td>
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<tr>
<td>MBC 4410</td>
<td>Nutrition in Health and Disease</td>
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<tr>
<td>MBC 4420</td>
<td>Neuroscience</td>
<td>2</td>
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<tr>
<td>MBC 4430</td>
<td>Biochemistry of Disease</td>
<td>2</td>
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<tr>
<td>MBC 4450</td>
<td>New Drug Development</td>
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<tr>
<td>MBC 4470</td>
<td>Advanced Immunotherapeutics</td>
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</tr>
<tr>
<td>MBC 4480</td>
<td>Chemical Defense Mechanisms in Plants</td>
<td>2</td>
</tr>
<tr>
<td>MBC 4710</td>
<td>Targeted Drug Design</td>
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<tr>
<td>MBC 4720</td>
<td>Advances in Drug Design</td>
<td>3</td>
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<tr>
<td>MBC 4760</td>
<td>Biochemical Toxicology</td>
<td>2</td>
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<tr>
<td>MBC 4770</td>
<td>Molecular Modeling in Drug Design</td>
<td>3</td>
</tr>
<tr>
<td>MBC 4800</td>
<td>Quantitative Structure Activity Relationships</td>
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<td>MBC 4880</td>
<td>Medicinal Biotech Lab</td>
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<tr>
<td>MBC 4980</td>
<td>Special Topics in Drug Design</td>
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<tr>
<td>PHCL 4140</td>
<td>Interpretation of Pharmaceutical Data</td>
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<td>PHCL 4150</td>
<td>Biopharmaceutics/Pharmacokinetics</td>
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<tr>
<td>PHCL 4300</td>
<td>Selected Topics in Pharmacology</td>
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<tr>
<td>PHCL 4630</td>
<td>Cancer Chemotherapy</td>
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<tr>
<td>PHCL 4710</td>
<td>Pharmacology – Toxicology Seminar</td>
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<td>PHCL 4720</td>
<td>Pharmacology IV</td>
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<td>PHCL 4730</td>
<td>Toxicology I</td>
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<td>PHCL 4750</td>
<td>Toxicology II</td>
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<tr>
<td>PHCL 4760</td>
<td>Toxicokinetics</td>
<td>3</td>
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<tr>
<td>PHCL 4770</td>
<td>Toxicological Risk Assessment</td>
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<td>PHCL 4800</td>
<td>Human-Xenobiotic Interactions</td>
<td>3</td>
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<td>PHCL 4850</td>
<td>Drug Disposition</td>
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<td>Hurs Seminar Pharmacology/Toxicology</td>
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<td>PHCL 4910</td>
<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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Pharmacy Administration 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 bachelor of science in pharmaceutical sciences degree. The business minor options under this major are as follows: business administration, professional sales, business administration and professional sales, business administration and M.B.A. track, and professional sales/business administration and M.B.A. track. 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.

Pharmacy Administration Major 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

BUAD 2040 or MATH 2630 or 2600 or equiv.

**Second Semester**

BUAD 2040 or ACTG 1040

BUAD 3010 Principles of Marketing

BUAD 3320 Medicinal Chemistry I

BUAD 3560 Physiological Chemistry I

PHCL 3700 Pharmacology I

**Fourth Year**

**First Semester**

BUAD 2050 or ACTG 1050

BUAD 3030 Manage. & Behav. Process in Orgs

BUAD 3040 Prin. of Financial Management

PHCL 4700 Pharmacology III

**Second Semester**

PHPR 4550 Analysis of Pharm. Environment

Business Minor Elective

Business Elective (choose any business course)

UT Core Requirement (Multicultural Studies)*

1 This requirement will be waived with a passing score on the microcomputer placement test, which is available at www.business.utoledo.edu.

2 A grade of C or higher is required for the minor.

3 PHPR 4520 or MKTG 3880 or 4540 may be taken as an alternative.

4 Choose from business administration minor requirements listed by the College of Business Administration.

* Suggested sequence

**Professional Sales Minor Option**

*Third Year*

**First Semester**

BUAD 2060 or MATH 2630 or 2600 or equiv.

ECON 1150 Principles of Macroeconomics

MBC 3310 Medicinal Chemistry I

MBC 3550 Physiological Chemistry I

PHCL 3700 Pharmacology I
### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BUAD 2040 or ACTG 1040</td>
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<tr>
<td>BUAD 3030</td>
<td>Principles of Marketing</td>
<td>3</td>
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<tr>
<td>MBC 3320</td>
<td>Medicinal Chemistry II</td>
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<td>MBC 3560</td>
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### Summer Between Third and Fourth Years

<table>
<thead>
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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHPR 4780</td>
<td>Practicum in Pharmacy Administration</td>
<td>6-12</td>
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### Fourth Year

#### First Semester

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<tr>
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<td>Manage. &amp; Behav. Process in Orgs</td>
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<td>PHCL 4700</td>
<td>Pharmacology III</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>
<th>Course</th>
<th>Title</th>
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<tr>
<td>BUAD 3040</td>
<td>Prin. of Financial Management</td>
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</tr>
<tr>
<td>PHPR 4550</td>
<td>Analysis of Pharm. Environment</td>
<td>3</td>
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<tr>
<td>PSLS 3080</td>
<td>Purch. &amp; Busi. Rela. Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>PSLS 4710</td>
<td>Sales Force Leadership</td>
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<td>PSLS 4740</td>
<td>Advanced Sales</td>
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<td>UT Core Requirement (Multicultural Studies)*</td>
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### Business Administration Minor and Professional Sales Minor Option

#### Third Year

##### First Semester

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<td>CMPT 1100</td>
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<td>0-3</td>
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<tr>
<td>ECON 1150</td>
<td>Principles of Macroeconomics</td>
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<tr>
<td>MBC 3310</td>
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<tr>
<td>MBC 3550</td>
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<td>PHCL 3700</td>
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##### Second Semester

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<th>Credits</th>
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<td>BUAD 3010</td>
<td>Principles of Marketing</td>
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<td>MBC 3560</td>
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</tr>
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<td>PHCL 3720</td>
<td>Pharmacology II</td>
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##### Summer Between Third and Fourth Years

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHPR 4780</td>
<td>Practicum in Pharmacy Administration</td>
<td>6-12</td>
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</table>

##### Fourth Year

##### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BUAD 2050 or ACTG 1050</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>BUAD 3030</td>
<td>Manage. &amp; Behav. Process Orgs</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 4700</td>
<td>Pharmacology III</td>
<td>3</td>
</tr>
<tr>
<td>PSLS 3440</td>
<td>Sales</td>
<td>3</td>
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<tr>
<td>PSLS 3450</td>
<td>Account &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>
<td>3</td>
</tr>
<tr>
<td>PHPR 4550</td>
<td>Analysis of Pharm. Environment</td>
<td>3</td>
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</tbody>
</table>

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1. A grade of C or higher is required for the minor.
2. PHPR 4520 or MKTG 3880 may be taken as an alternative.
3. Non-western Multicultural Studies* (IBUS 3150)*

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

#### Third Year

##### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>BUAD 1020 or CMPT 1100 or placement</td>
<td></td>
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<tr>
<td>BUAD 3030</td>
<td>Manage. &amp; Behav. Process in Orgs</td>
<td>3</td>
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<tr>
<td>ECON 1150</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
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<tr>
<td>MBC 3310</td>
<td>Medicinal Chemistry I</td>
<td>3</td>
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<tr>
<td>MBC 3550</td>
<td>Physiological Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 3700</td>
<td>Pharmacology I</td>
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##### Second Semester

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<tr>
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<tr>
<td>BUAD 2040 or ACTG 1040</td>
<td></td>
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<tr>
<td>BUAD 2060 or MATH 2630 or 2600 or equiv.</td>
<td>3</td>
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<tr>
<td>BUAD 3010</td>
<td>Principles of Marketing</td>
<td>3</td>
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<tr>
<td>MBC 3320</td>
<td>Medicinal Chemistry II</td>
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<td>MBC 3560</td>
<td>Physiological Chemistry II</td>
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<td>Pharmacology II</td>
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##### Summer Between Third and Fourth Years

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<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>PHPR 4780</td>
<td>Practicum in Pharmacy Administration</td>
<td>6-12</td>
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</table>

##### Fourth Year

##### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 2050 or ACTG 1050</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>BUAD 3040</td>
<td>Prin. of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 3070</td>
<td>Appl. of Stats in Busi Deci. Making</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 3010</td>
<td>Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 4700</td>
<td>Pharmacology III</td>
<td>3</td>
</tr>
</tbody>
</table>

##### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 3020</td>
<td>Principles of Mfg. &amp; Service Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 3040</td>
<td>Prin. of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>PHPR 4550</td>
<td>Analysis of Pharm. Environment</td>
<td>3</td>
</tr>
<tr>
<td>PHPR 4570</td>
<td>Pharmacy Management &amp; Marketing</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 3880</td>
<td>Mtg. Rsch. &amp; Data-Based Mgmt.</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 4540</td>
<td>Business Marketing</td>
<td>3</td>
</tr>
</tbody>
</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.
3. A grade of C or higher is required for the minors.
4. If IBUS 3150 is not taken for nonwestern multicultural studies, students should take BUAD 2070 for the double minors.

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

Third Year

First Semester
- BUAD 3030 Manage. & Behav. Process in Orgs…………………………..3
- CMPT 1100 or equiv or placement test2……………………………………0-3
- 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 or ACTG 1040..........................................................3
- BUAD 2060 or MATH 2630 or 2600 or equiv .................................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 Years
- PHPR 4780 Practicum in Pharmacy Administration ..................6-12

Fourth Year

First Semester
- BUAD 2050 or ACTG 1050..........................................................3
- BUAD 2070 Appl. of Stats in Bus Decision-making ...................3
- PHCL 4700 Pharmacology III ......................................................3
- PSLS 3440 Sales ........................................................................3
- PSLS 3450 Acct & Territory Management ..............................3

Second Semester
- BUAD 3040 Prin. of Financial Management...........................3
- PHPR 4550 Analysis of Pharm. Environment1..............................3
- PSLS 3080 Purch. & Busi. Rela. Mgmt........................................3
- PSLS 4710 Sales Force Leadership ............................................3
- PSLS 4740 Advanced Sales.........................................................3
- UT Core Requirement (Multicultural Studies)* ........................3

B.S.P.S. Practicum Description

All four majors in the bachelor of science in pharmaceutical sciences degree program require real-life workplace practicums in a variety of appropriate settings at local, regional, national and international sites. Most students schedule their practicums in the summer after their third year. Students are generally assigned to ongoing projects at the site and are evaluated on their performance by the project supervisor. A brief paper describing their role in the project is submitted to the coordinator for their major following completion of the practicum.

Doctor of Pharmacy Degree Requirements

In order to graduate with a Pharm.D. degree, students must meet the current academic performance standards. 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 bachelor of science in pharmaceutical sciences-Pharm.D. track degree. The curriculum is outlined below.

Preprofessional Division Requirements

First Year

First Semester
- BIOL 2150 Fundamentals of Life Sci. I........................................4
- BIOL 2160 Fundamentals of Life Sci. Lab I.................................1
- CHEM 1230 General Chemistry I ............................................4
- CHEM 1280 General Chemistry Lab I.................................1
- MATH 1750 Calculus for the Life Sciences I...............................4
- PHPR 1000 Orientation ..............................................................1
- UT Core Requirement (ENG 1110)* .........................................3

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 Calculus for the Life Sciences 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 ..........................4
- 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.

Professional Division Requirements

Third Year
First Semester
MBC 3310 Medicinal Chemistry I ......................................................... 3
MBC 3550 Physiological Chemistry I .................................................. 3
PHCL 3790 Pharmacology I ................................................................. 3
PHPR 3010 Pharmaceutical Calculations ............................................. 2
PHPR 3070 Pharmaceutics I ................................................................. 4
PHPR 3510 Pharmacoeconomic Dimensions of Health Care Systems .... 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 Interactions in Healthcare ..................................... 2
PHPR 4410 Professional Practice Development I ............................... 3
PHPR 4430 Pathophysiology and Pharmacotherapy: Introduction .......... 1

* Some students will take PHPR 3940 in the fall; others will take it in the spring.

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 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.

Fifth Year
First Semester: Summer Immediately Following Fourth Year
PHCL 5140 Interpretation of Pharm. Data .......................................... 2
PHPR 6210 Introduction to Research Methods .................................... 2
PHPR 6440 PPT: Infectious Disease .................................................... 4
PHPR 6940 Early Practice Exposure .................................................. 2

(HPHR 6940 will consist of 80 hours of pharmacy practice.)

Second Semester: Fall Semester-Fifth Year

Second Semester: Fall Semester-Fifth Year

Third Semester: Spring Semester-Fifth Year
PHPR 6240 Patient Care Rounds II .................................................. 3
PHPR 6250 Self Care ................................................................. 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
PHPR 8480 PPT: Neurology and Psychiatry ....................................... 3
Graduate Professional Electives* ..................................................... 2-3

Sixth Year
Fourth Year: Summer Immediately Following Fifth Year
PHPR 6370 PPT: Critical Care/Nutrition ........................................... 1
PHPR 6490 PPT: Hematology/Oncology ............................................ 3
PHPR 8260 Jurisprudence & Ethics for Pharmacy ................................ 1
PHPR 8500 PPT: Geriatrics and Pediatrics ....................................... 2
PHPR 8620 Seminar II ................................................................. 1
PHPR 8640 PPT: Capstone ............................................................ 2
Graduate Professional Electives* ..................................................... 2-3

* A total of 5 credit hours of Graduate Professional Electives is required

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

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

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

Pharm.D. 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/ 7100 Research Practices in Medicinal Chemistry ............... 1
MBC 5380 5620 Medicinal & Poisonous Plants ................................ 3
MBC 5620/ 7620 Biochemical Techniques .......................................... 2
MBC 6100/ 8100 Advanced Immunology ........................................... 2
MBC 6190/ 8190 Advanced Medicinal Chemistry ............................ 4
MBC 6200/ 8200 Biomedical Chemistry ............................................. 4
MBC 6420 8200 Protein Chemistry/CHEM 6510/8510...................... 2 or 4
MBC 6430/ 8430 Nucleic Acid Chem/CHEM 6530/8530 .................. 2 or 4
MBC 6440/ 8440 Enzymology/CHEM 6520/8520 ......................... 2 or 4

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.
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*, 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 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, 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

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, distinguished university professor
B.S. Pharm., Ph.D., The Ohio State University; R.Ph.

James Byers, 1998, associate 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, 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

Frederick 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
B.S. Pharm., The University of Toledo; M.S., Bowling Green State University; D.P.M., The Ohio State College of Podiatric Medicine

Chandramalika Ghosh, 2005, associate professor
B.S. Pharm., Jadarpur University, M.S. Pharmacy, Jadarpur University, Ph.D., University of Louisiana at Monroe

Department of Pharmacy Practice

Folasade Akala, 2005, instructor
Pharm.D., Howard University, R.Ph.

Kenneth S. Alexander, 1972, professor
B.Sc. Pharm., M.Sc., Philadelphia College of Pharmacy and Science; Ph.D., University of Rhode Island; Ed Sp., The University of Toledo; R.Ph.

Norman F. Billups, 1977, professor and dean emeritus
B.S. Pharm., M.S., Ph.D., Oregon State University; R.Ph.

Curtis D. Black, 1990, Merck Professor of Clinical Pharmacy
B.S. Pharm., The University of Toledo; M.S., Ph.D., Purdue University; R.Ph.

Mary C. Borovicka, 2002, assistant professor and director of CSU/UT Pharmacy Partnership Program
B.S. Pharm., Pharm. D., The University of Toledo; R.Ph.

Diane M. Cappelletty, 2001, associate professor
B.S. Pharm., Pharm. D., The Ohio State University; R.Ph.

Kevin Capurso, 2005, visiting assistant professor
Pharm.D., State University of New York at Buffalo, R.Ph.

Mariann D. Churchwell, 2005, assistant professor
B.S. Pharm., Wayne State University; Pharm.D., Wayne State University, R.Ph.

Angeline Gilis, 1996, lecturer
B.S. Pharm., The University of Toledo; R.Ph.

Charles L. Hicks, 1971, associate professor
B.S. Pharm., M.S., University of Iowa; R.Ph.

Monica G. Holiday-Goodman, 1988, associate professor
B.S. Pharm., Ph.D., Northeast Louisiana University; R.Ph.
Buford T. Lively, 1989, professor
B.S., West Virginia Institute of Technology; B.S. Pharm., West Virginia University; M.A., Marshall University; Ed.D. Pharm. Admin., West Virginia University; R.Ph.

Steven J. Martin, 1997, associate professor, interim chair
B.S. Pharm., Pharm.D., Ferris State University; R.Ph.

Laurie S. Mauro, 1985, associate professor
B.S. Pharm., Ohio Northern University; Pharm.D., The Ohio State University; R.Ph.

Vincent F. Mauro, 1985, professor
B.S. Pharm., Ohio Northern University; Pharm.D., The Ohio State University; R.Ph.

Rashmi R. Nair, 2006, assistant professor
B.S. Chemistry, University of Mumbai; M.S. Chemistry, M.B.A., Ph.D., University of Louisiana at Monroe

Martin J. Ohlinger, 2002, assistant professor
B.S. Biology, College of William and Mary; B.S. Pharm, Pharm.D., Virginia Commonwealth University/VCV; R.Ph.

Michael J. Peeters, 2005, lecturer
B.S. Pharm., University of Alberta, Pharm.D., University of Washington; R.Ph.

Sharrel L. Pinto, 2005, assistant professor
B.S. Pharm, D.M.M. University of Mumbai; M.S. Pharm., The University of Toledo, Ph.D., The University of Florida

Mary F. Powers, 2002, associate professor
B.S. Pharm., The University of Toledo; Ph.D., Medical College of Ohio; R.Ph.

Barbara Rudnicki, 1987, director of experiential program
B.S. Pharm., M.S., The University of Toledo, R.Ph.

Kimberly Schmude, 2002, visiting assistant professor
B.S. Pharm., Pharm.D., The University of Toledo, R.Ph.

Eric G. Sahloff, 2003, assistant professor
B.A. Biology, B.S. Pharm., Pharm.D., The University of Toledo, R.Ph.

Matthew A. Fuller, 1986, adjunct associate professor
B.Sc. Pharm., Ohio Northern University; Pharm.D., University of Cincinnati; R.Ph.

Morton Goldman, 1985, adjunct assistant professor
B.Sc. Pharm., University of Pittsburgh; Pharm.D., University of Cincinnati; R.Ph.

William L. Horvath, 1991, adjunct professor
M.D., Temple University

Judy Jones-Walker, 2005, prestige associate professor
B.Sc., M.S., Cornell University, Ed.S., University of South Carolina, Ph.D., University of Miami

Maurice E. Jones, 1981, adjunct associate professor
B.Sc. Pharm., University of North Carolina; Pharm.D., University of Michigan; R.Ph.

Steve Meyer, 1991, adjunct assistant professor B.S. Pharm
M.S., The University of Toledo; R.Ph.

Doug Parr, 1993, clinical assistant professor
B.S., Michigan State University; Pharm.D., University of Michigan; R.Ph.

Randy Pryka, 1989, clinical associate professor
B.S. Pharm., The University of Toledo; Pharm.D., University of Utah; R.Ph.

Steven R. Smith, 1991, clinical assistant professor
B.S. Pharm., Ohio Northern University; M.S., The University of Toledo; R.Ph.

Michael L. Thomas, 1995, adjunct instructor
B.S. Pharm., The University of Toledo; R.Ph.

Keith W. Trettin, 1996, clinical assistant professor
B.S. Pharm., M.B.A., The University of Toledo; R.Ph.

David Waller, 1981, clinical associate professor
B.S. Pharm., The University of Toledo; M.S., The Ohio State University; R.Ph.

CLINICAL AND ADMINISTRATIVE PRECEPTORS

James R. Adair, R.Ph.
Steve Adoryan, Pharm.D.
Christine Ahrens, Pharm.D.
Jennifer Ahlen, Pharm.D., BCPS
Folasade Akala, Pharm.D.
Charles Alday, Pharm.D.
Wayne Alversen, R.Ph.
David Anderson, R.Ph.
Cathy Anthony, R.Ph.
Bill Arting, R.Ph.
Steve Armatas, R.Ph.
David M. Augustine, R.Ph.

Sandra S. Axtell, Pharm.D., BCPS
Kenneth A. Bachmann, Ph.D.
Anne M. Baciewicz, Pharm.D.
Dennis Bajko, R.Ph.
S. David Baker, Pharm.D., DABAT
Deb Bakle-Carns, Pharm.D.
Todd Banks, R.Ph.
Jamie Bardo, Pharm.D.
Dominic Bartone, R.Ph.
Tom Bauer, R.Ph.
Adam Bauman, M.S., R.Ph.
Kim Begany, Pharm.D.

PRESTIGE CLINICAL FACULTY

Ernest E. Boyd, 1993, adjunct professor
B.S. Pharm., Butler University; M.B.A., Indiana University; R.Ph.

John Chudzinski, 1993, clinical instructor
B.S. Pharm., The University of Toledo; R.Ph.

Cynthia M. Dusik, 1992, clinical assistant professor
B.S. Pharm., Pharm.D., University of Illinois - Chicago; R.Ph.

* Joint appointment