

## WHAT IS PHARMACY?

Pharmacy is the health profession which specializes in the knowledge of drugs. The art and science of pharmacy requires a broad knowledge of the manufacture and distribution of drugs; their uses, strengths, doses; their side effects and potential harmful qualities. The pharmacist is the link between medical practice and the use of medicinal agents in the treatment of patients.

Employment of pharmacists is projected to have little to no change between 2018 to 2028. The number of pharmacy schools has increased in recent years, creating more graduates and increasing job competition. Students who choose to complete a residency program gain additional experience that may improve their job prospects. Scientific advances are leading to new drug products, and the duties of the modern pharmacist continue to extend far beyond the traditional role. The median annual salary for a pharmacist in 2018 was \$126,120. The best-paid ten percent made \$161,250 while the lowest made \$87,790.

## OPPORTUNITIES FOR PHARMACISTS

**Clinical Pharmacy** is an exciting and expanding area of practice for a large number of pharmacists. Direct patient involvement and responsibility for total drug therapy are major roles pharmacists assume. Specialty areas in pediatrics, mental health, nutrition, cardiology, oncology, nephrology, infectious disease, and internal medicine are well-defined and firmly established within the profession.

**Hospital Pharmacy** is a rapidly expanding area in which the pharmacist has an opportunity to practice in a highly professional atmosphere. Duties may include consultation with medical staff and instruction to other health care personnel. Many specialized areas of hospital practice have come into existence in recent years.

**Community Pharmacy** is where many pharmacists spend their careers, combining a healthcare focus with business and management experience. In this setting the pharmacist has the opportunity to meet and serve patients on a personal basis. Community practice entails more than the responsibility of filling prescription orders. Community pharmacists can provide immunizations, counsel patients about their medications, and some offer Medication Therapy Management (MTM) services. MTM involves pharmacists working with patients to review medications for appropriateness, cost savings, and possible adverse reactions. Community pharmacy includes retail chain pharmacy and independently-owned practice.

**Industrial Pharmacy** offers careers for pharmacists interested in research and development, production, sales, and distribution of pharmaceutical and other health supplies. The pharmaceutical industry is worldwide in scope. Entry into the field is generally through graduate or other advanced study. Other avenues of entry are through pharmaceutical sales, personnel management and administrative experience.

**University Teaching and Research** offer careers to pharmacists by way of graduate studies or other advanced training and experience. Many thousands of pharmacists are engaged in some aspect of teaching or research.

**Government Agencies** utilizing pharmacists include the United States Public Health Service, the Food and Drug Administration, the Veterans Administration, the armed forces, and state and local governments.

**Other Careers** for pharmacists include such fields as specialty consulting, institutional management, home health care, and managed care.

## PRE-PHARMACY PROGRAMS

Students may pursue admission to the UT College of Pharmacy by following one of three tracks: the two-year program, the 3+1 program, or the four-year program. While many students entering UTK may be undecided as to which option is most appropriate, they should carefully consider each track and select the option that best meets their academic goals.

## TWO YEAR PROGRAM

Students following the two year program do not receive a degree from The University of Tennessee, Knoxville. Rather, the student completes the following 62 credit hours of pre-requisite course work. Because of the sequencing of science courses, some students take advantage of summer course offerings in order to complete the prerequisites in two years.

Subject	Semester Hrs
English 101-102 or equivalent.....	6
Chemistry 120-130 (or 128-138).....	8
Biology 150 (or 158) or Biology 101-102.....	3-8
Biology 160 (or 168), 159 (or 167).....	5
Mathematics 125, 141 or 152.....	3-4
Chemistry 260 or 268 and 269 (see note 1).....	4
Chemistry 360 (or 368) and 359 (see note 1).....	4
Math 115, Statistics 201 or Psychology 385.....	3
Communication Studies 210 or 240 .....	3
Micro 210 or Biology 220, 229 (see note 2).....	3-5
BCMB 230 (physiology) .....	5
Ecology & Evolutionary Biology 240 (anatomy) .....	4
Social Science electives (see note 3) .....	6
Humanities electives (see note 4).....	6

### TOTAL HOURS: 62 hours minimum

Note 1: In Fall 2017, CHEM 350 became CHEM 260. Additionally, the organic chemistry lab changed from CHEM 369 to CHEM 269 and 359. Chemistry majors will take CHEM 269 and 449 along with CHEM 260 and 360 to complete the organic sequence.

Note 2: FDST 429 Food Microbiology Lab can substitute for BIOL 229.

Note 3: Anthropology, economics, political science, psychology, and sociology are preferred, but the UT College of Pharmacy will accept any of UT's social science general education options.

Note 4: Humanities at UTCOP include art, literature, foreign language, philosophy and history. To satisfy the UTK arts and humanities requirement, refer to the UT catalog at [catalog.utk.edu](http://catalog.utk.edu).

### THREE PLUS ONE (3+1) PROGRAM

The 3+1 program leads to a Bachelor of Science degree from The University of Tennessee, Knoxville, in Pre-Professional Programs with a concentration in Pharmacy. In this program, the student completes at least 90 hours before entering the pharmacy program. These hours include the Perspectives, Foundations, and Connections requirements of the College of Arts and Sciences and the courses required as prerequisites by the College of Pharmacy. The BS degree is granted upon successful completion of the first year of study in pharmacy at the UT Health Science Center. Students in the program must complete the last 30 hours of credit in residence at UT, Knoxville, before enrolling in the College of Pharmacy.

A student following this program has the advantage of completing a bachelor's degree from The University of Tennessee as well as the Pharm.D. degree, thus leaving open more options in the event the student changes careers or decides to pursue graduate study. Equally important, a student in this track maintains the option to return to complete a bachelor's degree with an Arts and Sciences major if he/she is not initially accepted to pharmacy school after the three years at UT, Knoxville.

### FOUR-YEAR PROGRAM

The four-year program, leading to either a BA or BS degree from The University of Tennessee, Knoxville, is granted upon completion of 120 or more credit hours. These hours include the Perspectives, Foundations, and Connections requirements for the College of Arts and Sciences, a major of 30 or more hours, and the courses required as prerequisites by the College of Pharmacy. A student in the four-year program must complete the last 30 hours of credit in residence at The University of Tennessee, Knoxville.

This option is designed for the student who is interested in gaining in-depth knowledge in a major of choice while also completing the prerequisite work for the College of Pharmacy. A student in this program leaves open the option to select among many professional programs, as well as to prepare for career alternatives if not accepted to pharmacy school.

### Sample Curriculum for the 3+1 and Four-Year Programs

The following sequence of courses is appropriate for students pursuing either the 3+1 or the four-year program. The College of Arts and Sciences *Curriculum Guide and Advising Handbook* as well as the undergraduate catalog ([catalog.utk.edu](http://catalog.utk.edu)) contains course options for communicating through writing, foreign language, social science, arts & humanities, non-US history, global challenges, and connections. All students pursuing a degree from UT must complete UT's General Education Requirement.

*Based on the 2019-2020 Undergraduate Catalog*

<b>FRESHMAN</b>	<b>Semester Hrs</b>
English 101-102 or equivalent .....	6
Chemistry 120-130 (or 128-138) .....	8
Biology 150 (or 158) (see note 1).....	3
Biology 160 (or 169) and 159 (or 167) .....	5
MATH 125,141 (or 147), or 152 (see note 2) .....	3-4
Foreign Language – Intermediate (see note 3) .....	6
<b>Total Semester Hours 31-32</b>	

### SOPHOMORE

Chemistry 260-269 and 360-359 (see note 4) .....	8
Communication Studies 210 or 240.....	3
Social Sciences (see note 5).....	6
Non-U.S. History.....	6
Art & Humanities (see note 6).....	6
Global Challenges (if Biology 150 not taken) .....	0-3
Statistics 201 (or 207) or Math 115.....	3

**Total Semester Hours 32-35**

### JUNIOR

Connections (see note 7) .....	9
Microbiology 210 or Biology 220,229 (see note 8) ..	3-5
Biochemistry & Cellular & Molecular Biology 230 .....	5
Ecology and Evolutionary Biology 240 .....	4
Electives .....	3
Communicating through Writing .....	3

**Total Semester Hours 27-29**

The three plus one program requires completion of at least **90** hours of undergraduate work (last 30 at UT, Knoxville) before entering UT Health Science Center.

### SENIOR

Completion of major program and BA/BS requirements, or completion of one year at UT Health Science Center.

**TOTAL HOURS: 120 hours minimum**

Note 1: Pre-pharmacy students who have previously completed BIOL 101 and 102 may substitute this sequence for BIOL 150 if they are not pursuing a major that requires BIOL 150.

Note 2: Math placement depends on high school courses and grades, ACT scores, and BA/BS requirements. Students considering a major in a biological or physical science should consult the catalog for the appropriate math courses.

Note 3: This requirement assumes a student has had enough language background in high school to begin an intermediate language sequence at UTK.

Note 4: In Fall 2017, CHEM 350 became CHEM 260. Additionally, the organic chemistry lab changed from CHEM 369 to CHEM 269 and 359. Chemistry majors will take CHEM 269 and 449 along with CHEM 260 and 360 to complete the organic sequence.

Note 5: Anthropology 130, Economics 201, Political Science 101, 102, Psychology 110, and Sociology 110, 120 are preferred, but any UTK social science will fulfill the requirement. Two courses must be completed, representing two departments.

Note 6: Students must select at least one course from List A. The two courses must represent two departments.

Note 7: Students will satisfy the Connections requirement by completing one of the following: a minor or second major, nine hours of study abroad coursework, or nine hours from a Connections package.

Note 8: Students completing a BS in Biological Sciences from UTK should complete Biology 220, 229 for this requirement since Microbiology 210 will not fulfill a major requirement. Biology 220 has a prerequisite of Biology 150, 160 and 159 or Biology 101 and 102. FDST 429 Food Microbiology Lab can substitute for Biology 229 for the UT College of Pharmacy.

## STUDENT ORGANIZATIONS

**Alpha Epsilon Delta (AED)** is a pre-health honor society that seeks to provide information and opportunities for students with an interest in the health professions. The Tennessee Beta Chapter of AED is active at The University of Tennessee. AED activities include information sessions on preparing to apply to professional schools, local speakers from the health community, trips to Tennessee medical schools and health centers, and service activities. The schedule of meetings, requirements for membership, and the application are available at: website: <https://aedutk.wixsite.com/aed-utk>.

**Academy of Student Pharmacists (APhA-ASP)** is a student group affiliated with the American Pharmacists Association. APhA-ASP activities include opportunities to hear from practicing pharmacists, participation in programs with current UT College of Pharmacy students, and participation in mock interviews. [www.pharmacist.com/apha-asp](http://www.pharmacist.com/apha-asp)

Any pre-health student, regardless of membership, may attend programs sponsored by these organizations. Pre-health students wishing to receive notification of pre-health activities should send an e-mail to [asadvising@utk.edu](mailto:asadvising@utk.edu) to request to be added to the pre-health distribution list.

## SEMINAR FOR PRE-HEALTH STUDENTS

During each fall semester, Arts and Sciences Advising Services offers a one credit hour course entitled "*Introduction to Health Care Delivery*." This one credit hour seminar course is taught in the Wood Auditorium of UT Hospital. The course provides weekly seminars on topics such as managed care, family practice, ethical issues in medicine, malpractice, allied health programs, and many others. The course is listed in the timetable under Interdisciplinary Programs (INPG) 210. The course is open to any interested student.

## PHARMACY COLLEGE ADMISSIONS TEST (PCAT)

The American Association of Colleges of Pharmacy sponsors the Pharmacy College Admission Test (PCAT). This test utilizes a computer-based test (CBT) format. Testing dates are in July, September, October, November, January, and February of each year. The PCAT measures achievement in critical reading, biology, chemistry, quantitative reasoning, and writing.

Beginning with the fall 2019-2020 application cycle, UTHSC College of Pharmacy no longer requires students to take the PCAT. However, if you are planning to apply to multiple institutions, you will want to verify if they require the PCAT.

## PHARMCAS

PharmCAS ([www.pharmacas.org](http://www.pharmacas.org)) is a centralized application service for applicants applying to schools of pharmacy. The UT College of Pharmacy as well as over half of all the pharmacy schools in the nation participates in this centralized service. Students who are applying to any of the participating schools complete a single

application on-line. This application is distributed electronically to each school requested by the applicant.

## LETTERS OF REFERENCE/EVALUATION

Most pharmacy schools require letters of reference as part of the application process. Students should make every effort to become well acquainted with professors prior to requesting letters of reference from them. Students who are *only* applying to PharmCAS schools will have their recommenders submit their letters of reference directly to PharmCAS. The UT College of Pharmacy requires three letters, one from a faculty member and two from other sources such as a work supervisor or pharmacist.

Students who are also applying to schools not participating in PharmCAS will ask their recommenders to submit recommendations directly to the non-participating schools.

## APPLICATION TO THE COLLEGE OF PHARMACY AT UT HEALTH SCIENCE CENTER AND PHARMCAS

UT College of Pharmacy offers students two pathways to admission: Direct Admission and Traditional Admission.

The Direct Admission program provides students the opportunity to apply to and be given an early acceptance to the UTHSC College of Pharmacy at the beginning of their undergraduate college program. Application to the Direct Admission program may be accessed by visiting the following website: <http://www.uthsc.edu/pharmacy/prospective-students/admissions/options.php>.

Students applying to the UT College of Pharmacy through the traditional admission pathway must complete the online application through PharmCAS, the Pharmacy College Application Service.

UT College of Pharmacy invites most competitive students for on-site interviews, which are conducted in both Memphis and Knoxville. Interviews take place during late fall and spring. UT College of Pharmacy utilizes a rolling admissions process, which concludes in mid-April. All admitted students begin the PharmD program in the fall semester.

February 1 is the deadline for traditional admission; however, the College of Pharmacy recommends that applications be made early. Admission is through a Committee on Admissions and is based on the overall qualifications of the applicant. Academic record, references, and other information in the application are considered.

A grade of "C-" or above must be achieved for each required pre-pharmacy course.

Any candidate may be required to complete additional course work without regard to his/her grade point average at the time of evaluation.

All advanced placement and CLEP credits are accepted as long as your undergraduate institution acknowledges and awards said credits. Advanced placement credits must be verifiable through their appearance on official undergraduate college transcripts.

A student who has been awarded advanced placement credit or other non-traditional credit in prescribed science courses by the undergraduate college will have those credits honored in fulfilling requirements for the College of Pharmacy, provided such placement has been followed by a more advanced course in the same discipline. For example, a student granted credit for biology will be required to complete the (8) eight semester hour requirement by taking advanced courses in that discipline.

Work experience or shadowing in a pharmacy setting is not a requirement for admission to the college. However, such experience is valuable in determining a person's motivation to pursue this field of study. Community service is also valuable.

### NASHVILLE AND KNOXVILLE CAMPUSES

The College of Pharmacy has additional campuses in Nashville and Knoxville. The addition of these campuses allows students the option to complete their final three years of the Pharm.D. program in Nashville or Knoxville. All students spend the first professional year at the UT Health Sciences Center in Memphis. Students may spend their clinical rotations in locations across the state. Campus preference (Memphis, Nashville, or Knoxville) is based on earliest acceptances with secured enrollment deposit or geographic exemption.

### RESIDENCY POLICY: UT HEALTH SCIENCE CENTER (Memphis)

UT Health Science Center in Memphis is a state-supported institution and gives preference to qualified Tennesseans. Non-resident enrollment in the College of Pharmacy averages 20 - 30%.

### DOCTOR OF PHARMACY (PHARM.D.) PROGRAM

At the completion of four years of professional studies, students will receive a Doctor of Pharmacy degree. The last three semesters comprise an intensive program of clinical experience at sites across the state doing rotations in retail pharmacy settings and in various units of the hospitals, such as cardiology and neurology. In addition to the clinical rotations, the Pharm.D. candidates will also be taking courses such as pharmacology, therapeutics, patient assessment, and pharmacogenomics. The Pharm.D. program is oriented to clinical practice rather than research.

### PRE-PHARMACY STATISTICS

UT HEALTH SCIENCE CENTER FALL 2017

Applicants	Accepts	Average GPA	Average PCAT
654	193	3.38	60 %-ile

### DOCTOR OF PHARMACY - DOCTOR OF PHILOSOPHY DUAL DEGREE PROGRAM

The primary objective of the Pharm.D./Ph.D. dual degree program is to provide highly qualified individuals with the education and training necessary to enter challenging careers in pharmaceutical research in the 21st century.

This innovative program is designed, through integration of the requirements of both the Pharm.D. and the Ph.D. degrees, to reduce the total time for the completion of the two degrees while maintaining the high standards of both programs. Seven years are required to

complete this degree.

Graduates of the dual degree program will be comprehensively trained pharmaceutical scientists who participate in research ranging from basic studies at the molecular and cellular level to human clinical investigations.

### APPLICATION TO ALL OTHER COLLEGES OF PHARMACY

This pre-pharmacy bulletin includes the specified courses required for admission to UT College of Pharmacy. Students wishing to prepare for professional training at institutions other than the UT College of Pharmacy should consult the catalogs and websites of those institutions to determine the specific preparation required for admission.

### ADDITIONAL INFORMATION IS AVAILABLE FROM:

UT College of Pharmacy

<http://www.uthsc.edu/pharmacy/>

[futurepharmacist@uthsc.edu](mailto:futurepharmacist@uthsc.edu)

(901) 448-6036

Arts and Sciences Advising Services

313 Ayres Hall

Knoxville, TN 37996-1335

(865) 974-4481

<http://www.artsci.utk.edu/advising/>

American Pharmacists Association

<http://www.aphanet.org>

Tennessee Pharmacists Association

(615) 256-3023

<http://www.tnpharm.org>

Pharmacy is Right for Me

<https://pharmacyforme.org/>

The information in this bulletin is subject to revision as additional material becomes available. Students are strongly encouraged to consult with a health professions advisor and/or the pharmacy school website on a regular basis in order to obtain the most accurate information possible.

ADMISSION TO THE COLLEGE OF PHARMACY IS AT THE DISCRETION OF THAT COLLEGE. ADMISSION TO THE UNIVERSITY OF TENNESSEE, KNOXVILLE, AND COMPLETION OF THE PRE-PHARMACY PROGRAM IN THE COLLEGE OF ARTS AND SCIENCES DOES NOT ASSURE ADMISSION TO UT HEALTH SCIENCE CENTER IN MEMPHIS.

THE UNIVERSITY OF TENNESSEE, KNOXVILLE

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