The Doctor of Pharmacy Program

The six-year Pharmacy Program at Wilkes University consists of two components. The first is the two-year Pre-Pharmacy Program, and the second is the Professional Program.

Pre-Pharmacy Guaranteed Seat Program

Admission to the Pre-pharmacy Guaranteed Seat Program (Enrollment Limit: up to 90)

Students may only enter the Pre-Pharmacy Guaranteed Seat Program as freshmen from high school with the exception of parallel students that may apply at the end of their freshman year, if academically qualified. Minimum criteria for consideration for admission are listed below (with the exception that parallel Wilkes students may apply at the end of their freshman year, if academically qualified).

A student is not required to be in the Pre-Pharmacy Guaranteed Seat Program to be eligible to apply to the School of Pharmacy. Students may apply directly to the professional program during, or after, their sophomore year.

Applicants for the Pre-Pharmacy Guaranteed Seat Program must complete the online Wilkes University Application. If a student indicates pharmacy, a supplemental application with instructions will become available to the applicant. Minimum requirements are described below. The School of Pharmacy will review these applications, and top applicants will be invited for a personal interview. Final admission into the program will be based on a thorough evaluation of students based on high school performance (e.g., class rank, GPA, or class percentile), SAT or ACT scores, the Letter of Intent essay, and the results of the personal interview. Interviewed applicants not selected for immediate admission will be placed on a wait list. Wait-listed students will be offered seats in the Pre-Pharmacy Guaranteed Seat Program as seats become available. In some instances, students may not be notified of an available seat in the Pre-Pharmacy Guaranteed Seat Program until the summer. School of Pharmacy applications for the Pre-Pharmacy Guaranteed Seat Program must be completed by February 1. As applicants are admitted on a rolling basis, all seats may be awarded before the February 1 deadline. Applicants are encouraged to complete the application process as early as possible.

Applicants should review the Technical Standards set forth by the School of Pharmacy that are available at:

https://wilkes.edu/academics/colleges/nesbitt-school-of-pharmacy/program-information/pre-pharmacy-guaranteed-seat-program/technical-standards.aspx

These Technical Standards describe non-academic abilities that are required for admission to, continuation in, and graduation from the School of Pharmacy to obtain a Pharm.D. degree.

Minimally, each applicant to the Pre-Pharmacy Guaranteed Seat program must:

- be a graduate of, or near graduation from, an accredited high school or academy;
- rank in the upper half of his or her class or overall GPA of 3.0 or higher OR an overall grade percentile 80%;
- attain a combined SAT score of 1080 or ACT 22 or greater;
- complete the School of Pharmacy Pre-Pharmacy Application (This application is in addition to the Wilkes University Admissions Application.), including the Letter of Intent;
Pharmacy

• submit three recommendation letters from teachers, employers, pharmacists, or other individuals who can provide an objective appraisal of the student's ability;
• be prepared to discuss their knowledge of the pharmacy profession through individual research, optional shadowing experiences, or discussions with pharmacists; and
• successfully complete an interview with the School of Pharmacy.

PLEASE NOTE: Attaining minimum academic requirements does not infer or promise either an interview or admission into the Pre-Pharmacy Guaranteed Seat Program!

Pre-Pharmacy Program - Required Courses and Recommended Course Sequence**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*[BIO-121] – Principles of Modern Biology I</td>
<td>4</td>
</tr>
<tr>
<td>*[CHM-113] – Elements &amp; Compounds Lab</td>
<td>1</td>
</tr>
<tr>
<td>*[CHM-115] – Elements &amp; Compounds</td>
<td>3</td>
</tr>
<tr>
<td>*[ENG-101] – Composition or [*MTH-111] – Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>*[FYF-101] – First-Year Foundations</td>
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</tr>
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<thead>
<tr>
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<tbody>
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<td>*[BIO-122] – Principles of Modern Biology II</td>
<td>4</td>
</tr>
<tr>
<td>*[CHM-114] – The Chemical Reaction Lab</td>
<td>1</td>
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<tr>
<td>*[CHM-116] – The Chemical Reaction</td>
<td>3</td>
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<tr>
<td><strong>Distribution Requirements</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td>*[ENG-101] – Composition or [*MTH-111] – Calculus I</td>
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<td><strong>Total Credits</strong></td>
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<thead>
<tr>
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<tr>
<td><em>[CHM-231] – Organic Chemistry I</em>** and [[CHM-233]] Organic Chemistry I lab***</td>
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<tr>
<td>*[COM-101] – Fundamentals of Public Speaking</td>
<td>3</td>
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<td><strong>Distribution Requirements</strong></td>
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<tr>
<td>*[EC-102] – Principles of Economics II</td>
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<thead>
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<th>Fourth Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*[CHM-365] – Medical Biochemistry or *[CHM 232 Organic Chemistry II]</td>
<td>4</td>
</tr>
</tbody>
</table>

*Denotes prerequisite course.
**Some requirements may be fulfilled via satisfactory achievement on advanced placement tests or Wilkes’ challenge examinations.

Pharmacy Professional Program

The Professional Program is four years and leads to the Doctor of Pharmacy (Pharm.D.) degree. Graduates of the program are eligible for state examination to become licensed pharmacists after completing appropriate internship hours. The four years of education consist of three years of in-class (i.e., lecture, laboratory, discussion group) introductory pharmacy experiences and one final year of advanced experiential education.

Admission to the Professional Program (Enrollment limit: 72)

To be admitted into the Professional Program of the School of Pharmacy, a student must have either enrolled in and successfully completed the Pre-Pharmacy Guaranteed Seat Program at Wilkes University as outlined above or have submitted a successful application to the School of Pharmacy.

I. Admission through the Pre-Pharmacy Guaranteed Seat Program

Students enrolled in the Wilkes University Pre-Pharmacy Guaranteed Seat Program who meet ALL of the following conditions are automatically admitted to the Professional Program:

• You must complete four semesters as a full-time Pre-Pharmacy student and successfully complete, with a 2.0 or higher, ALL prerequisite courses, specifically by the end of the spring semester prior to admission. PREREQUISITE COURSES are listed in the PRE-PHARMACY PROGRAM (previous page) marked with a (*);
• You must maintain a PREREQUISITE COURSE cumulative GPA of 3.0 or better for the PREREQUISITE COURSES through the spring of the fourth semester (sophomore year). Failure to maintain a prerequisite cumulative GPA of 3.0 or better in the PREREQUISITE COURSES through the spring of the fourth semester (sophomore) will result in forfeiture of the guaranteed seat;
• You must maintain a cumulative GPA of 3.0 or better for all courses taken through the spring of the fourth semester (sophomore year). Advanced placement courses may be accepted in fulfillment of some of these requirements. However, grades for AP-accredited courses will not be factored into the prerequisite or overall GPAs. Although non-prerequisite course credit hours may be transferred to Wilkes from other colleges, you should be aware that grades do not transfer. In other words, if you take courses somewhere else, the credit hours
You must earn grades of 2.0 or greater in all PREREQUISITE COURSES through the spring of the fourth semester (sophomore year) will result in forfeiture of the guaranteed seat;

- You must maintain the highest levels of academic and personal honesty and be free from criminal/drug-related offenses throughout the program. Pharmacy students must complete annual criminal background checks as a requirement for progression and retention within the School of Pharmacy;
- Students caught in the act of cheating, collusion, plagiarism, or other and all acts in violation of the Wilkes University policy on Intellectual Responsibility and Plagiarism or the Student Code of Conduct may be subject to dismissal from the Pre-pharmacy Guaranteed Seat Program;
- You must receive a favorable recommendation from your Pre-Pharmacy advisor at the end of your spring semester prior to admission. Failure to receive a favorable recommendation from your Pre-Pharmacy advisor at the end of your spring semester prior to admission will result in forfeiture of the guaranteed seat; and
- You must meet all the criteria set forth in the Technical Standards Document. Failure to meet the criteria set forth in the

**Technical Standards Document may delay or prevent graduation from the Nesbitt School of Pharmacy.**

A maximum of two uncompleted General Education Curriculum requirements will be considered for admission into the Professional Program in Pharmacy. Pre-Pharmacy Guaranteed Seat students with more than two uncompleted General Education courses may appeal to the Student Affairs Committee of the School of Pharmacy for consideration. There is no room in the Pharmacy Curriculum to complete General Education requirements. General Education Curriculum requirements may be completed at other accredited colleges or universities and transferred into Wilkes University with proper approval.

**Students in the Wilkes University Pre-Pharmacy Guaranteed Seat Program who do not meet these conditions must compete for available seats in the Professional Program through the application process.**

**II. Admission through the Application Process**

Faculty reserve the right to select among the applicants who will have the best opportunity to complete the curriculum within four years and have productive professional lives. Admission is based upon the student’s academic ability as reflected in grades from Pre-Pharmacy courses, number of courses repeated, typical course loads, PCAT scores, total academic career, and references, as well as a successful interview. If applicable, the committee will also consider the most recent academic performance for those non-traditional students returning to college life after a hiatus. Each spring, a select group of applicants is invited for an interview, based upon a complete evaluation of all submitted application materials. Any missing documentation will compromise the application. We must receive your PCAT results prior to the January 15th deadline.

The number of seats in the professional program available through the application process is dependent on the number of Pre-Pharmacy Guaranteed Seat students able to claim a seat. A portion of remaining seats are available on an academically competitive basis to Wilkes Students with overall and prerequisite GPAs above a 2.5, and a portion of seats is available to transfer students with overall and prerequisite GPAs above a 2.5 on a competitive basis. To be classified as a Wilkes student, the student must complete and be enrolled at Wilkes University for two full-time semesters prior to enrollment in the Professional Program AND must complete 18 credits of prerequisite courses at Wilkes University with average and prerequisite GPAs above a 2.5 and overall GPA of 2.5 on a competitive basis. A maximum of two uncompleted General Education Curriculum requirements will be considered for admission into the Professional Program through the application process.

Guaranteed Seat Program who do not meet these criteria will result in classification as a “transfer student.”

Applicant should review the Technical Standards set forth by the School of Pharmacy, which are available at:

https://www.wilkes.edu/academics/colleges/nesbitt-college-of-pharmacy/program-information/pre-pharmacy-guaranteed-seat-program/technical-standards.aspx

These Technical Standards describe non-academic abilities that are required for admission to, continuation in, and graduation from the School of Pharmacy to obtain a PharmD degree.

**Pharmacy Professional Program – Minimum Admission Requirements**

To be considered for admission to the Professional Program of the School of Pharmacy, the applicant

- should complete the Wilkes University General Education course requirements or have completed a baccalaureate degree. A maximum
We will evaluate the grades of higher-level courses to include in the PharmD program. Students will be required to submit, and clear per site prerequisite courses and maintain the highest levels of academic and personal honesty and be free from criminal/drug-related offenses throughout the pharmacy program. Non-Wilkes transfer students (non-Wilkes, transfer student) by the end of the spring semester prior to admission; must successfully (2.0 or higher) complete all Pharmacy Prerequisite Courses listed below by the end of the spring semester prior to admission. Must provide three completed recommendation forms; must obtain scores on the Pharmacy College Admission Test (PCAT) by January 15th. The School will only accept PCAT scores from the July, September, and October/November dates; we will not accept scores from the January test since we will not receive the results prior to the January 15th application deadline.

NOTE: Admission into the Professional Program in Pharmacy is extremely competitive. Earning the minimum academic criteria necessary to submit an application does not in any way infer or promise an interview or admission into the program.

Pharmacy Professional Program – Prerequisite Courses

- Two semesters (8 credits) of General Chemistry with labs
- Two semesters (8 credits) of Organic Chemistry with labs
- Two semesters (8 credits) of General Biology with labs
- One semester (4 credits) of Calculus
- One semester (4 credits) of Statistics
- One semester (3 credits) of Microeconomics
- One semester (3 credits) of Oral Communications
- One semester (3 credits) of Statistics
- One semester (3 credits) of Microeconomics
- One semester (3 credits) of Oral Communications
- One semester (3 credits) of Statistics
- One semester (3 credits) of Microeconomics
- One semester (3 credits) of Oral Communications

III. Pharmacy Organization

Professional Standards

Students enrolled in the program of the School of Pharmacy are expected to endorse professional standards by subscribing to the Oath of the Pharmacist. Students are also expected to abide by the American Pharmacists Association’s Code of Ethics of the Profession.

Technical Standards

Students applying to and enrolling in the School of Pharmacy are expected to read, acknowledge, and understand the Technical Standards. These Technical Standards describe non-academic abilities that are required for admission to, continuation in, and graduation from the School of Pharmacy to obtain a Pharm.D. degree.

A candidate must have abilities and skills in the following five areas: 1) observational skills; 2) communication skills; 3) motor skills; 4) intellectual, conceptual, integrative, and quantitative skills; and 5) behavioral and social skills. Detailed descriptions of the Technical Standards are provided in the School of Pharmacy Application or by contacting the School of Pharmacy Dean's office.

Progression Requirements

All students in the Professional Program of the School of Pharmacy are required to meet minimum standards for progression. Academic progression requirements include a minimum semester and cumulative pharmacy GPA of 2.0. In addition, no student shall be allowed more than 8.0 credits of less than 2.0 grades in required professional courses both inside and outside of the school. Any course with a grade of 0.0 must be repeated. At the end of each semester the progress of each student in the Professional Program will be reviewed. Students failing to meet minimal academic standards at the end of any semester must petition the Student Review Subcommittee through the Assistant Dean of Student Affairs to progress further in the school. More inclusive policies, including, but not limited to, Technical Standards, acceptable classroom and experiential site behavior, alcohol and substance abuse, and other issues impacting the image of the professional program and the student, adopted within these guidelines are distributed annually to all students in the Nesbitt School of Pharmacy Student Handbook. Advanced Pharmacy Practice Experiences (APPE) progression is described in the APPE Course Manual.

Experiential Curriculum Component

Experiential learning is a critical component of the curriculum at Wilkes. Before being placed in an experiential setting, (and repeated at varying intervals), all students are required to:

- possess an active Pennsylvania Pharmacy Intern License (comply with ACT 31 relating to CHILD ABUSE RECOGNITION AND REPORTING);
- possess professional liability insurance;
- have documentation of immunizations;
- pass a physical examination;
- be certified in Basic Cardiac Life Support (healthcare provider), Basic First Aid, and complete OSHA training;
• have a criminal background check completed and clear per site requirements, by an approved provider when required; and
• complete and clear other site-specific requirements, such as FBI fingerprint check, PA child abuse background check, etc.

These criteria are fully described throughout the curriculum, including deadlines and ramifications of non-compliance.

The Introductory Pharmacy Practice Experience (IPPE)
The Introductory Pharmacy Practice Experience (IPPE) consists of a number of different experiences. During the summer following successful completion of the P-1 year, students will complete a 2-week (80-hour) Introductory Pharmacy Practice Experience (IPPE I). The second professional year, the P-2 year, includes 40 hours of IPPE II during the fall and/or spring semesters. In addition, students will complete a 2-week (80-hour) IPPE III during the summer following the P-2 year. In the third year of the Professional Program, the P-3 year, the curriculum includes a two-semester course in service learning (longitudinal care) and 20 hours of IPPE IV. IPPE V is a self-directed IPPE and consists of 20 hours of independent pharmacy-related, service-oriented learning earned during the P1 through P3 years. IPPE’s occur at practice sites and in the community in the Wilkes-Barre/Scranton area, not on campus.

The Advanced Pharmacy Practice Experience (APPE)
The fourth year of the Professional Program, the P-4 year, is devoted to Advanced Pharmacy Practice Experience (APPE). Each student will be assigned to one six-week rotation, plus six five-week rotations, some of which may be at some distance from Wilkes-Barre. To the extent possible, the School of Pharmacy will assist in locating safe, affordable housing for APPE’s. Since patient care is a continuous activity, some experiences may be conducted outside of regular school and business hours. Note also that the APPE start and end dates do not adhere to the regular University calendar.

NOTE: The student is responsible for paying all transportation and housing costs associated with all experiential components of the curriculum, except where noted.

Graduation, Degree, and Licensure Requirements
It is the student’s responsibility to comply with all graduation requirements, and it is expected that all students accepted into the Pharm.D. Program will meet regularly and frequently with their advisors to ensure timely progress toward their Doctor of Pharmacy degree. Graduation is dependent on successful completion of all required and elective course requirements in the School of Pharmacy (see Progression Requirements) AND completion of all General Education Requirements mandated by Wilkes University.

A student entering the Professional Program with a bachelor’s degree from a four-year accredited U.S. college or university is exempt from the University’s General Education Requirements, but is not exempt from the prerequisite entry requirements prescribed by the School of Pharmacy for entry into the Professional Program. Students applying with degrees or courses from foreign Colleges or Universities will be evaluated to ensure significant portions of the General Education Requirements are satisfied.

All non-degreed students entering the Professional Programs are encouraged to complete the General Education Requirements prior to beginning the Professional Curriculum. As mentioned, a student may be deficient in two General Education Requirements and be granted admission into the program. Students will receive consultation and documentation from their advisor that these courses must be completed prior to graduation. Students with more than two deficient General Education courses may appeal to the Student Affairs Committee of the School of Pharmacy for consideration. This requirement is in place since there is limited room within the professional curriculum, including summers, to complete the courses.

As a matter of record, non-degreed students who have successfully completed the second professional year (P-2) in the School of Pharmacy AND completed all General Education Requirements will be awarded a Bachelor of Science degree. The pass-through B.S. degree does not meet eligibility requirements for licensure as a pharmacist; it is only intended to acknowledge the academic achievement of students completing four years of university-level education.

Pharmacy licensure is governed by state law. All states require graduation from an accredited School or College of Pharmacy. Additional requirements for licensure should be requested from the state in which licensure is sought. It is the student’s responsibility to fulfill all requirements for the state in which they seek licensure. Students must contact that State Board of Pharmacy for all appropriate paperwork. For further information, please contact the Dean’s Office in the School of Pharmacy.

The School of Pharmacy reserves the right to revise the Pharmacy Curriculum at any time in order to prepare students for future practice roles, meet new accreditation requirements and to incorporate innovations in instruction.

Doctor of Pharmacy Program - Required Courses and Recommended Course Sequence for the Professional Program

P-1 Fall Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>[PHA-301]</td>
<td>Found. of Pharm. Practice I</td>
<td>2</td>
</tr>
<tr>
<td>[PHA-308]</td>
<td>Pharm. and Health Care Delivery</td>
<td>3</td>
</tr>
<tr>
<td>[PHA-311]</td>
<td>Pharmaceutics I</td>
<td>4</td>
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<tr>
<td>[PHA-313]</td>
<td>Pharm. Calculations</td>
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<td>[PHA-327]</td>
<td>Medical Microbiology</td>
<td>3</td>
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<tr>
<td>[PHA-331]</td>
<td>Anatomy &amp; Physiology I</td>
<td>4</td>
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P-1 Spring Semester

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<tbody>
<tr>
<td>[PHA-302]</td>
<td>Pharmacy Care Lab I</td>
<td>1</td>
</tr>
<tr>
<td>[PHA-304]</td>
<td>Found. of Pharm. Practice II</td>
<td>2</td>
</tr>
<tr>
<td>[PHA-310]</td>
<td>Clinical Research Design</td>
<td>3</td>
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<tr>
<td>[PHA-312]</td>
<td>Pharmaceutics II</td>
<td>4</td>
</tr>
<tr>
<td>[PHA-332]</td>
<td>Anatomy &amp; Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>[PHA-365]</td>
<td>Medical Biochemistry*** or Elective</td>
<td>2-4</td>
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<tr>
<td>Total Credits</td>
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P-1 Summer

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>[PHA-335]</td>
<td>IPPE I*</td>
<td>2</td>
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Wilkes University Undergraduate Bulletin 2019 - 2020
# Pharmacy

## P-2 Fall Semester

<table>
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<tbody>
<tr>
<td>PHA-401</td>
<td>Pharmacy Care Lab II</td>
<td>1</td>
</tr>
<tr>
<td>PHA-405</td>
<td>Pharmaceutical Care Systems</td>
<td>2</td>
</tr>
<tr>
<td>PHA-411</td>
<td>Biopharm. &amp; Clinical Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>PHA-421</td>
<td>Pharmacotherapeutics I</td>
<td>2</td>
</tr>
<tr>
<td>PHA-423</td>
<td>Pharmacotherapeutics II</td>
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<tr>
<td>PHA-425</td>
<td>Pharmacotherapeutics III</td>
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<td>Elective</td>
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## P-2 Spring Semester

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<tbody>
<tr>
<td>PHA-402</td>
<td>Pharmacy Care Lab III</td>
<td>1</td>
</tr>
<tr>
<td>PHA-410</td>
<td>Biotechnology/Immunology</td>
<td>3</td>
</tr>
<tr>
<td>PHA-412</td>
<td>Mgt. of Pharm. Operations</td>
<td>3</td>
</tr>
<tr>
<td>PHA-426</td>
<td>Pharmacotherapeutics IV</td>
<td>2</td>
</tr>
<tr>
<td>PHA-428</td>
<td>Pharmacotherapeutics V</td>
<td>4</td>
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<tr>
<td>PHA-430</td>
<td>Pharmacotherapeutics VI</td>
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<td>PHA-440</td>
<td>IPPE II</td>
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## P-2 Summer

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<tr>
<td>PHA-445</td>
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## P-3 Fall Semester

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<td>PHA-501</td>
<td>Pharmacy Care Lab IV</td>
<td>1</td>
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<tr>
<td>PHA-503</td>
<td>Longitudinal Care I</td>
<td>1</td>
</tr>
<tr>
<td>PHA-505</td>
<td>Pharmacy Law</td>
<td>2</td>
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<tr>
<td>PHA-509</td>
<td>Economic Evaluation of Pharm.</td>
<td>3</td>
</tr>
<tr>
<td>PHA-521</td>
<td>Pharmacotherapeutics VII</td>
<td>2</td>
</tr>
<tr>
<td>PHA-523</td>
<td>Pharmacotherapeutics VIII</td>
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<tr>
<td>PHA-525</td>
<td>Pharmacotherapeutics IX</td>
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## P-3 Spring Semester

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<tbody>
<tr>
<td>PHA-502</td>
<td>Pharmacy Care Lab V</td>
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## P-4 Advanced Pharmacy Practice Experiential Year

*Introduction to Pharmacy Practice Experience

**Sequential Courses

***Elective may be taken if CHM 365 taken prior to P1 year

# APPE Rotations

The APPE portion of the curriculum consists of 7 rotations in various settings. One rotation is 6 weeks in duration, and the others are 5 weeks each in duration for a total of 35 credits over 36 weeks. Entry into APPEs requires successful completion of the P1-P3 curriculum in full.

There are four required APPE rotations:

- [PHA-510] Internal Medicine
- [PHA-511] Ambulatory Care
- [PHA-512] Community Practice
- [PHA-513] Health System

In addition, there are three elective APPE rotations. Information will be provided during the P-3 year.

# PHA. PHA

## PHA-301. & PHA 304 FOUNDATIONS OF PHARMACY PRACTICE

**Credits: 2**

The purpose of this two-semester course is to provide the student with the foundational knowledge, skills and attitudes needed to practice pharmacy in the 21st century. In particular, this course will focus on skills (communication, teamwork), attitudes and other content relevant to the practice of pharmacy. The school’s team-focused approach to learning is emphasized throughout. This course fulfills experiential requirements and so students will have the opportunity to interact with pharmacists and patients. Requirement: P-1 standing.
PHA-302. , 401, 402, 501 & 502 PHARMACY CARE LAB I - V
Credits: 1 each
This five-semester sequence is designed to develop the student's ability to integrate and apply information as well as practice skills that are taught throughout the curriculum. The use of case studies, role-plays, presentations, and other active-learning strategies engages students in the learning process and requires them to synthesize information at increasing levels of complexity as the student moves through the course sequence.
Requirement: P-1, P-2, or P-3 standing, as appropriate for each laboratory.

PHA-308. PHARMACEUTICAL AND HEALTH CARE DELIVERY
Credits: 3
Examination of health and pharmaceutical delivery in the U.S. conducted from a societal perspective. Emphasis is on public policy, economic behavior, and outcomes. Application will be made to various pharmaceutical sectors (e.g., retail, health, systems, manufacturing). Students should gain an understanding of the factors driving transformation of health care delivery and the implications for future pharmacy practice. Lecture: three hours per week. Requirement: P-1 standing or consent of the instructor.

PHA-310. CLINICAL RESEARCH AND DESIGN
Credits: 3
In order to apply current research to patient care activities, one must first develop the skills to interpret studies. The purpose of this course is to learn how research studies are designed to answer specific clinical questions, and how the study design is important in interpreting the results of the studies. Students will apply research design concepts and statistical techniques to design, critically analyze, and interpret preclinical, clinical, and economic studies of pharmaceuticals and treatment plans. Lecture: three hours per week.

Pre-Requisites
[[MTH-150]] or equivalent and P-1 standing or consent of the instructor.

PHA-313. PHARMACY CALCULATIONS
Credits: 1
The common mathematical processes that a pharmacist may encounter in professional practice are covered. Interpretation of the prescription, including Latin abbreviations, will be discussed. Medical terminology and the generic name, trade name, manufacturer, and classification of the top 100 drugs will also be presented. Lecture one hour per week. Requirement: P-1 standing or permission of the instructor.

PHA-327. MEDICAL MICROBIOLOGY
Credits: 3
An overview of microbiology with special emphasis on pathogenic microbiology. Lecture: three hours per week. Requirement: P-1 standing or consent of the instructor.

PHA-331. & PHA 332 MEDICAL ANATOMY AND PHYSIOLOGY I & II
Credits: 4
In-depth principles of human anatomy and physiology as well as an introduction to pathophysiology will be presented. Lecture: Two hours per week. Recitation and Lab: two hours per week. Requirement: P-1 standing or consent of the instructor. This course is restricted to enrolled Pharmacy students. Consideration may be given to non-pharmacy students with overall GPAs of 3.0 or greater, if there is room in the lecture and lab sessions, and with instructor approval. NOTE: PHA 331 is a prerequisite for PHA 332.

PHA-335. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE I
Credits: 2
This course will provide introductory practice experience to students in the community setting. The course fosters the development of professionalism in an environment of practical application of knowledge, skills, and attitudes. Students will be faced with a variety of issues practical to community pharmacy. The student will take an independent learning approach under the supervision of a practicing community pharmacist. The course is two full-time weeks (80 hours) of experience.

Pre-Requisites
Successful completion of all required courses in the P-1 year or permission of instructor.

PHA-365. MEDICAL BIOCHEMISTRY
Credits: 4
Introduction to basic biochemistry concepts, focusing on the structure and function of vitamins, proteins, and lipids as well as bioenergetics and major catabolic pathways. The catabolism of carbohydrates, fats and amino acids will be discussed including reactions and regulation. Common metabolic pathways of drugs, enzyme induction and metabolism down regulation will also be presented. Lecture: Four hours per week. Cross-listed with [(CHM-365)], [(BEGR-465)].

Pre-Requisites
CHM-232 or CHM-235 with a grade of 2.0 or better or permission of the instructor.

PHA-405. PHARMACEUTICAL CARE SYSTEMS: DESIGN AND CONTROL
Credits: 2
Examines delivery of pharmaceutical products and services from a systems perspective in a variety of patient care settings. Focus is upon effectiveness, efficiency, and quality. Covers design of systems, establishment and monitoring of key indicators, total quality management, and quality assurance agencies (e.g., JCAHO, NCQA). Lecture: two hours per week.

PHA-410. IMMUNOLOGY AND BIOTECHNOLOGY
Credits: 3
A discussion of nonspecific host defense mechanisms and a detailed description of specific immunity. Products that impart artificial active and passive immunity are presented. The concept of biotechnology is discussed together with the currently available products of genetic engineering that relate to immunology. The various immunological disorders and the immunology of cancer and HIV are discussed. Lecture: three hours per week.

Pre-Requisites
[[PHA-331]], [[PHA-332]], or consent of the instructor.
**PHARMACY**

**PHA-411. BIOPHARMACEUTICS AND CLINICAL PHARMACOKINETICS**  
Credits: 3  
The fundamentals of biopharmaceutics and pharmacokinetics are presented. The physical and chemical properties of the drug, dosage form, route of administration, patient characteristics, and disease state will be related to the absorption, distribution, metabolism, and elimination in the body. Students will become familiar with calculations for individual drugs to determine regimens that optimize the safety and effectiveness of medications for individual patients. Lecture: three hours per week.

**Pre-Requisites**  
[[PHA-311]], [[PHA-312]], or consent of the instructor.

**PHA-412. MANAGEMENT OF PHARMACY OPERATIONS**  
Credits: 3  
The principles of management, including personnel and financial management, will be covered as they apply to management of pharmacy operations in a variety of settings (e.g., community, health system, managed care). Lecture: three hours per week.

**Pre-Requisites**  
[[PHA-308]], or consent of the instructor.

**PHA-421. PHARMACOTHERAPEUTICS I: PRINCIPLES OF PHARMACOLOGY & MEDICINAL CHEMISTRY**  
Credits: 2  
This course is the 1st of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This particular course will emphasize the most fundamental concepts central to drug therapy. A major emphasis will be placed on the interactions of drugs with their cellular targets in the human body, and the chemical properties of drugs that dictate their biological activity.

**Pre-Requisites**  
[[PHA-310]], [[PHA-327]], [[PHA-331]], [[PHA-332]] and [[PHA-365]]

**PHA-422. PHARMACOTHERAPEUTICS II: PRINCIPLES OF PHARMACOTHERAPEUTICS**  
Credits: 2  
This course is the 2nd of a twelve module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for understanding Pharmacotherapeutics principles.

**Pre-Requisites**  
[[PHA-421]].

**PHA-423. PHARMACOTHERAPEUTICS III: SELF-CARE AND DERMATOLOGY**  
Credits: 3  
This course is the 3rd of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of dermatological disorders and self-care issues.

**PHA-424. PHARMACOTHERAPEUTICS IV: AUTOIMMUNE AND MUSCULOSKELETAL DISORDERS**  
Credits: 2  
This course is the 4th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of joint, autoimmune and musculoskeletal diseases.

**Pre-Requisites**  
*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-430]]

**PHA-425. PHARMACOTHERAPEUTICS V: INFECTION DISEASES**  
Credits: 4  
This course is the 5th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of infectious diseases.

**PHA-426. PHARMACOTHERAPEUTICS IV: GASTROINTESTINAL DISORDERS**  
Credits: 2  
This course is the 6th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of gastrointestinal diseases.

**PHA-427. PHARMACOTHERAPEUTICS VI: JOINT, AUTOIMMUNE AND MUSCULOSKELETAL DISORDERS**  
Credits: 2  
This course is the 7th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of joint, autoimmune and musculoskeletal diseases.

**Pre-Requisites**  
*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-430]]

**PHA-428. PHARMACOTHERAPEUTICS VII: INFECTION DISEASES**  
Credits: 4  
This course is the 8th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of infectious diseases.

**PHA-429. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE I**  
Credits: 1  
This course will provide introductory practice experience to students in two health care settings: prescriber’s clinics and a clinical pharmacy site. Students will have an independent approach to learning and gain a broader understanding of these settings and the role that pharmacists may play. Requirement: Successful completion of all required courses in the P-1 year, or permission of instructor.
PH-A445. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE III
Credits: 2
This course will provide introductory practice experience to students in the health-system setting. The course fosters the development of professionalism in an environment of practical application of knowledge, skills, and attitudes. Students will be faced with a variety of issues practical to this area of practice. The student will take an independent learning approach under the supervision of a practicing community pharmacist. The course is two full-time weeks (80 hours) of experience. Requirement: Successful completion of all required courses in P-2 year, or permission of instructor.

PH-A450. NEUROPHARMACOLOGY OF DRUGS OF ABUSE
Credits: 3
In-depth analysis of drugs of abuse, including pharmacokinetics, pharmacodynamics, tolerance, sensitization, physical dependence, and effects of drug use during pregnancy. Drug testing and substance abuse treatment strategies will also be discussed. Lecture: three hours.

Pre-Requisites
[[PHA-421]] or consent of the instructor.

PH-A452. EXTEMPORANEOUS COMPOUNDING
Credits: 3
Students will achieve basic and advanced skills in compounding pharmaceutical dosage forms for individualized patient therapy to replace a lack of commercially available products and enhance therapeutic problem-solving between the pharmacist and physician to enhance patient compliance. Students will work independently on research assignments and compounding preparations. Lecture: one hour per week. Lab: six hours per week.

Pre-Requisites
[[PHA-311]] and [[PHA-312]] and consent of the instructor.

PH-A456. CONCEPTS IN PRIMARY CARE
Credits: 2
The course is designed to allow students to explore and develop advanced knowledge and skills related to diseases and medications commonly encountered in a primary care environment. This course will be of value to pharmacy students seeking careers in ambulatory care pharmacy practice, community pharmacy, long-term care and population health management. Topics are presented in a case-based discussion format that includes multiple diseases and medications and through student-led mini topic discussions.

Pre-Requisites
P2 standing

PH-A488. ASPECTS OF CARING FOR THE PAIN PATIENT
Credits: 2
Terms Offered: Fall
This course is an interactive and interprofessional approach to the assessment and management of pain. Various teaching and learning strategies will allow students to develop and appreciate the understanding of the social, psychological, physical, spiritual and ethical implications of pain.

Pre-Requisites
[[PHA-331]] and [[PHA-332]]
PHA-510. GENERAL MEDICINE ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6
Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in general medicine practice. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites
Successful completion P1-P3 curriculum in full.

PHA-511. AMBULATORY CARE ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6
Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in ambulatory care settings. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites
Successful completion P1-P3 curriculum in full.

PHA-512. COMMUNITY ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6
Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in community practice settings. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites
Successful completion P1-P3 curriculum in full.

PHA-513. HEALTH SYSTEM ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6
Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in the health system settings. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites
Successful completion P1-P3 curriculum in full.

PHA-515. NAPLEX PREPARATION
Credits: 0
This course will be provided annually to P4 students to assist in preparation for The North American Pharmacist Licensure Examination (NAPLEX). Students will complete cumulative exams assigned by the coordinator.

Pre-Requisites
P4 standing.

PHA-521. PHARMACOTHERAPEUTICS VII: PULMONARY DISORDERS*
Credits: 2
This course is the 7th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of pulmonary diseases.

Pre-Requisites
*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].
PHA-327. CHEMISTRY

Terms Offered: Fall
This course will provide an introduction to the laws of chemical behavior, including topics such as stoichiometry, atomic structure, and chemical reactions. Students will gain a foundational understanding of the principles of chemistry and how they apply to various fields.

Pre-Requisites

Course completion is required.

PHA-544. MANAGED CARE PHARMACY

Credits: 2
This elective is intended to help future pharmacists interested in any area of practice better understand the clinical and business decision-making processes of the health care system. This elective will introduce and reinforce the concepts of population health and value, explore tools available to limit healthcare spending, and discuss unique ways pharmacists can be involved in improving patient care. This course will be offered during the spring semester each year.

Pre-Requisites

P2 or P3 standing.

PHA-552. PRINCIPLES OF BIOORGANIC AND MEDICINAL CHEMISTRY

Credits: 3
Terms Offered: Spring
This will be an introductory course, the aims of which are to provide the principles of bioorganic and medical chemistry, including an understanding of drug structure-activity relationships, prediction of the physicochemical properties of a drug, basic knowledge of the major pathways of drug metabolism, and factors that can contribute to drug-drug interactions.

Pre-Requisites

[[CHM-231]], [[CHM-232]], [[PHA-327]], 365.

PHA-555. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE IV

Credits: 0.5
Terms Offered: Fall
This course will provide introductory practice experience to students in the clinical pharmacy setting. Students will gain a broader understanding of this setting and the role that pharmacists may play. Requirement: successful completion of all required courses in the P2 year, or permission of instructor.

Pre-Requisites

Completion of all required courses in P2 year.

PHA-540. COMPREHENSIVE DIABETES MANAGEMENT

Credits: 3
This course provides a multidisciplinary foundation for health professionals in the principles of diabetes management. Students who successfully complete the course will have knowledge and the basic skill set that is needed to begin practicing diabetes management. The majority of this course is independent self-study of online lectures, but there are mandatory on-campus discussions and exams. Requirement: P2 or P-3 standing.

Pre-Requisites

P2 or P3 standing.

PHA-534. INTRODUCTION TO HOSPITAL PHARMACY PRACTICE

Credits: 2
This course introduces students to the practice of pharmacy within a hospital setting. Topics discussed include the accreditation process for hospitals, career options and residency or fellowship training, medication formulary management, automation and technology in hospital pharmacies, medication calculations, medication safety, clinical pharmacy practice, and sterile product preparation.

Pre-Requisites

[[PHA-331]], [[PHA-332]], [[PHA-365]] or consent of the instructor.

PHA-560. ROLE OF PHYTOCHEMICALS ON HEALTH AND DISEASE

Credits: 2
Students will learn the basic concepts and classification of phytochemicals present in our daily diet, followed by the study of specific phytochemicals and their relation to human health and disease. Basic mechanisms and pathways through which phytochemicals act and alter will be discussed. Students will have an opportunity to gain an in-depth understanding of a specific phytochemical of their choice or any other phytochemical designated by the instructor through a research review paper and an in-class presentation.

Pre-Requisites

P2 standing.
PHARMACY

PHA-558. PRINCIPLES OF TOXICOLOGY: FROM BEAKER TO BEDSIDE
Credits: 2
This toxicology elective is designed to provide the student with introductory knowledge of the molecular mechanisms of action and clinical management of poisons. The course will begin with introductory concepts such as history, mechanisms of cell injury and toxicant disposition. The student will then be exposed to the fundamental principles of managing an acutely poisoned patient. Toxicology lectures on each major organ system will prepare students for group presentations. The aims of student presentations will be to achieve a greater understanding of the clinical management of the poisoned patient, and to hone presentation skills. To the extent that is feasible, the course will involve lectures, or other learning experiences, led by external specialists.

The scope of poisons that will be discussed is broad, and includes environmental toxins, industrial toxicants, and drugs. Specific agents will include heavy metals, volatile solvents, common plant toxins, rodenticides, and several drugs. Students may be expected to participate in one laboratory exercise, wherein they will learn a fundamental method to characterize the mechanism and/or extent of cell death induced by a toxicant.

Pre-Requisites
P-2 or P-3 standing or permission of the instructor

PHA-560. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE V
Credits: 0.5
The Self-Directed Introductory Pharmacy Practice Experience (SD-IPPE) course is designed to expose students to various service-learning opportunities throughout their P1 through P3 years. This experience consists of three components: participation in and development of service-learning projects, reflection, and self-directed learning. Students may develop their own experiences or participate in opportunities offered by the School or professional organizations.

Requirements for service learning hours will increase as the student progresses through the curriculum. Each student must complete a minimum of 2, 8, and 10 hours during the P1, P2, and P3 years, respectively (total 20 hours). Additional details are provided in the SDIPPE syllabus conveniently posted in E*Value.

Pre-Requisites
P1 standing.

PHA-561. PRINCIPLES OF ENVIRONMENTAL HEALTH FOR PUBLIC HEALTH PRACTICE
Credits: 3
Environmental health is concerned with the mechanisms by which the natural and created environment impact public health. The altered physical, chemical and biological systems will be presented from the perspectives of the population and community health. The course will focus on disease prevention, assessment and mitigation of environmental challenges to public health.

Pre-Requisites
[PHA 564] Cross-listed with [PHA 310] or permission of instructor

PHA-562. SOCIAL AND BEHAVIORAL ASPECTS OF PUBLIC HEALTH
Credits: 3
Learners will develop public health competency in social concepts and processes that influence health status and public health interventions using the ecological approach. Targeted examination of population and individuals behaviors which influence health will utilize a range of methods necessary for behavioral change.

Pre-Requisites
[PHA 564] Cross-listed with [PHA 310] or permission of instructor

PHA-563. PUBLIC HEALTH AND PHARMACY
Credits: 3
This course will introduce students to the role pharmacists play in public health. Content will discuss the history of pharmacy and how public health was introduced into the field of pharmacy. The role of public health as it relates to the work of the pharmacy by providing education on policy, patient education and population management will also be included.

Pre-Requisites
[PHA 564] Cross-listed with [PHA 310] or permission of instructor

PHA-564. CLINICAL RESEARCH AND DESIGN
Credits: 3
This course focuses on the application of research design concepts and statistical techniques to design critically analyze and interpret multiple study designs. Understanding and practicing research methods are essential for pharmacists for two reasons. First, as a consumer of research, you will need to read and critically analyze published research. As a member of a health care team, you will need to maintain current awareness of the existing literature and its relevance to the case at hand. Second, as a provider of research, you will need the ability to validate your practice through scientific investigation (e.g. in the current healthcare arena it is expected that health care providers justify, through research, more of their practice).

Pre-Requisites
P1 standing or instructor permission

PHA-599. A, B AND C ELECTIVE ADVANCED PHARMACY PRACTICE EXPERIENCE ROTATIONS
Credits: 5-6
Advanced pharmacy practice experience involved in different aspects of pharmaceutical care. (Courses to be determined.) Clinical practice: 40 hours per week for a total of five weeks.

Pre-Requisites
Successful completion P1-P3 curriculum in full.