



 BUTLER  
UNIVERSITY  
SUMIT PATEL  
PHARMACY STUDENT  
COLLEGE OF PHARMACY AND HEALTH SCIENCES

# COLLEGE of PHARMACY *and* HEALTH SCIENCES

## Administration

Mary H. Graham, PharmD, Dean; Bruce D. Clayton, PharmD, Associate Dean; Bonnie K. Brown, PharmD, Associate Dean for Student Affairs; Pamela L. Crowell, PhD, Department Chair of Pharmaceutical Sciences; Julia M. Koehler, PharmD, Associate Dean for Clinical Education and External Affiliations; Jane M. Gervasio, PharmD, Department Chair of Pharmacy Practice; Jennifer A. Snyder, PhD, PA-C, Director of the Physician Assistant Program; Laurie L. Pylitt, MHPE, Director of Assessment (ex officio); Amy Sutton Peak, PharmD, Director of Undergraduate Health Sciences Programs

## Professors

Mary H. Graham, PharmD; Bonnie K. Brown, PharmD; Bruce D. Clayton, PharmD; Pamela L. Crowell, PhD; Sudip K. Das, PhD; Jane M. Gervasio, PharmD; Julia M. Koehler, PharmD; Jennifer A. Snyder, PhD, PA-C; Michael A. Vance, PhD; Jeanne H. Van Tyle, PharmD

## Associate Professors

Erin L. Albert, PharmD, MBA, JD; Jarrett R. Amsden, PharmD; Alex J. Ansara, PharmD; Meghan M. Bodenbergh, PharmD; Kendra M. Damer, PharmD; Patricia S. Devine, PharmD; Nandita G. Das, PhD; Mikaela Drake, PhD; Alexandre M. Erkin, PhD; Donald R. Frosch, MS, PA-C; Dennis C. Gardner, PharmD; Todd W. Hrubej, PhD; Joseph K. Jordan, PharmD; Laurence A. Kennedy, PhD; Chad A. Knoderer, PharmD; Carrie M. Maffeo, PharmD; Sarah A. Nisly, PharmD; Emily C. Papineau, PharmD; Amy Sutton Peak, PharmD; Laurie L. Pylitt, MHPE; Brenda L. Quincy, PhD; Darin C. Ramsey, PharmD; Carriann E. Richey-Smith, PharmD; Laura F. Ruekert, PharmD; Lindsay M. Saum, PharmD; Dane L. Shiltz, PharmD; Tracy L. Sprunger, PharmD; Kevin M. Tuohy, PharmD; Alison M. Walton, PharmD; Jennifer S. Zorn, MS, PA-C

## Assistant Professors

Kimberly M. Beck, PhD; Tracy J. Costello, PharmD; Lauren M. Czosnowski, PharmD; Stephanie L. Enz, PharmD; Hala M. Fadda, PhD; Samuel L. Gurevitz, PharmD; Jennifer R. Guthrie, MPAS, PA-C; Weimin C. Hong, PhD; Carolyn M. Jacobs-Jung, PharmD; Chioniso P. Masamha, PhD; Jennifer A. McCann, PharmD; Annette T. McFarland, PharmD; Kristen R. Nichols, PharmD; Angela V. Ockerman, PharmD; Sheel M. Patel, PharmD; Cathy M. Ramey, PharmD; Jason T. Range, JD, PhD; David J.

Reeves, PharmD; Chris T. Roman, MA, MMS, PA-C; Priscilla T. Ryder, PhD; Daniel P. Sturm, MMS, PA-C; Jessica S. Triboletti, PharmD; Kali Veness, MPAS, PA-C; Jessica E. Wilhoite, PharmD; Deborah S. Zeitlin, PharmD

## Instructors

Lisa Berra, PA-C; Mark Bochan, MD; Michael Pauszek, MD; James Pike, DO; Lauren Rau, MD; Leila Reed, PA-C; Emily Skeeters, PA-C; Margaret S. Stratford, PharmD; Ashley Townsend de Lara, PharmD; Larry VanderMolen, MPAS, PA-C; Lori Vasquez, PA-C

## College Website

[www.butler.edu/cophs](http://www.butler.edu/cophs)

## Mission

The mission of the College of Pharmacy and Health Sciences (COPHS) is to provide effective educational experiences in the health sciences. By so doing, the College facilitates the development of lifelong learners with a liberal arts foundation who are able to serve society as dedicated, competent health professionals and community leaders.

## Values

- **Professionally focused—inspire with excellence in teaching and model lifelong learning.** We have a passion for our life work and have dedicated our careers to training the next generation of health care providers and educators. We look for new ways to improve learning, and we adapt to the need for new knowledge, skills, and attitudes. We share our practical experiences with our students so that what they learn is directly connected to actual patient care or to our scholarship. We utilize real-life experiences wherever possible so that students develop an appreciation for the patient and societal variables that add complexity to the care of an individual or of a population. As faculty, we have developed a collaborative learning environment and are respectful and supportive of one another.
- **Student focused—dedicated to our students.** We are dedicated to our students and are committed to their development, both inside and outside the classroom, with teaching, advising, project oversight, and experiential learning.

- **Patient focused—dedicated to our patients and our professions.** We are experienced health care practitioners and investigators who exude a high regard for patient care that is transmitted to our students. We teach others so our professions can excel and provide better patient care and research each day.

## Goals

- **Education and Practice.** Advance the practice of our health care professions and emphasize the importance of an interdisciplinary approach by providing effective and innovative programs for undergraduate, graduate, and professional-level learners.
- **Research and Scholarly Activity.** Conduct focused research and scholarly activity that is consistent with our expertise and tied to student experiences.
- **Public Health, Service, and Leadership.** Foster leadership and service for students, faculty, and staff through public health-related community outreach, University and College service, and involvement in professional organizations.
- **Employer of Choice.** Create an employment environment that provides leadership, personal growth, and resources to be a desired place of employment for the ongoing vitality of our programs.
- **Collaboration.** Develop collaborations to increase the reach and effectiveness of our programs and public health initiatives.

## Conduct Code

In addition to complying with the Rights and Responsibilities section of the Butler University Student Handbook ([www.butler.edu/campus-life/student-handbook](http://www.butler.edu/campus-life/student-handbook)), students enrolled in College of Pharmacy and Health Sciences programs will also be expected to comply with the Professional Conduct Code outlined in the COPHS Student Handbook, available at [www.butler.edu/cophs/student-resources](http://www.butler.edu/cophs/student-resources).

## Accreditation

The College of Pharmacy and Health Sciences is a member of the American Association of Colleges of Pharmacy and the Physician Assistant Education Association. The Pharmacy program is fully accredited by the Accreditation Council for Pharmacy Education through June 2020. The Physician Assistant program holds Accreditation-Continued status from the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA), granted

when a currently accredited program is in compliance with ARC-PA Standards. For this program, the next validation review is expected to be in March 2017.

## Degree Programs

The College of Pharmacy and Health Sciences offers the doctor of pharmacy (PharmD) degree that provides eligibility for licensure as a pharmacist. The College also offers a doctor of pharmacy with pharmaceutical science or patient care research emphasis, a doctor of pharmacy with medical Spanish emphasis, a doctor of pharmacy/master of science in pharmaceutical sciences dual degree, a doctor of pharmacy/master of business administration dual-degree program that awards both the PharmD and MBA degrees upon simultaneous completion of the respective degree requirements, and a graduate program leading to a master of science in pharmaceutical sciences.

The College offers the master of physician assistant studies degree (MPAS) that provides eligibility for licensure as a physician assistant.

The College of Pharmacy and Health Sciences also offers a bachelor of science in health sciences (BSHS). Two majors are offered within the BSHS program. The Health Science major is more clinically focused and serves as the direct admit pathway into the MPAS program. The new major Healthcare and Business will be offered in collaboration with the College of Business beginning in fall 2016.

For general information on applying and admission to any Butler graduate program or course, see Admission Information and Requirements chapter. College- and program-specific requirements are detailed below.

## Doctor of Pharmacy

[www.butler.edu/cophs/pharmd-program](http://www.butler.edu/cophs/pharmd-program)

The doctor of pharmacy (PharmD) degree program prepares students to become pharmacy practitioners who possess the knowledge and skills required to function as authorities on the use of medicines, and who can apply pharmaceutical and biomedical science to the practical problems of drug therapy. Pharmacists are capable of contributing to the interdisciplinary delivery of primary health care and can function as drug therapy specialists. Students also are prepared for specialty professional studies and for graduate study in the pharmaceutical sciences.

## Admission

- Applicants to the pre-professional or professional program who are non-native English speakers are required to submit the results of the Test of Spoken English (TSE-A) or Test of English as a Foreign Language (TOEFL).
- The doctor of pharmacy curriculum requires that students complete two pre-professional years and four professional years of study. Acceptance into the professional phase of the program allows students to begin the first professional year (P1) coursework. Students entering the fall semester of P1 must satisfactorily complete all math/science and other pre-professional coursework required as prerequisites for enrollment in P1 professional courses.
- Acceptance into the professional pharmacy program by either the automatic advancement option, the internal application option, or the PharmCAS application option is contingent upon enrollment capacity limitations of the program.
- The College of Pharmacy and Health Sciences reserves the option to modify its pharmacy program admission and advancement procedures at any time.

### Automatic Advancement for Pre-Pharmacy Students Entering as First-Year Students

Students enrolling as first-year students at Butler University and declaring pre-pharmacy as their initial major are eligible to be automatically admitted to the P1 year of the pharmacy program upon completion of their third semester of Butler enrollment if they meet the following criteria:

- Cumulative grade point average (GPA) at Butler University of 3.0 or higher.
- GPA greater than 3.0 in nine selected, critical pre-pharmacy courses listed below.
- No grade less than C- in any of the pre-pharmacy courses stipulated below. A student may repeat a course to satisfy a subsequent course prerequisite. (Note: Withdrawals during the first student year will have no effect on the GPA calculation, but courses must be completed. A withdrawal during the fall semester, sophomore year, from one of the nine classes used in the automatic advancement formula will result in loss of automatic advancement.)
- Successful completion of an in-person standardized interview, including evaluation of verbal communication and interpersonal skills, ethical and professional characteristics, intellectual

curiosity, leadership and emotional maturity, respect and empathy for others, and creativity.

- Successful completion of a standardized writing prompt.

### Courses That Determine the Automatic Advancement GPA

CH105, General Chemistry  
CH106, General Chemistry  
MA106, Calculus and Analytical Geometry  
BI105, Introductory Cell Biology  
FYS101, First Year Seminar 1  
FYS102, First Year Seminar 2  
CH351, Organic Chemistry  
PX100, Health Sciences Seminar  
PX326, Anatomy and Physiology 1

Eligibility for automatic advancement into the P1 year of the pharmacy program ceases after the student's review for professional phase admission at the end of his or her third semester at Butler University.

A student seeking pharmacy program admission by the automatic advancement option may not count more than three courses transferred from another university or awarded through advanced placement (AP) or the International Baccalaureate (IB) program toward the calculation of his or her automatic advancement GPA.

A student failing to automatically advance to the professional pharmacy program will be considered for admission to the program on a competitive, space-available application basis. Applications are available from the Student Affairs Office (Pharmacy and Health Sciences Building, room 102). This process considers the student's cumulative GPA for all coursework completed at all universities, completion of the standardized writing prompt, and an attribute assessment through an interview.

### Transfer Students and Internal Applicants Not Classified as Pre-Pharmacy

Students who enter Butler University with 12 or more credit hours completed after high school graduation are classified as transfer students. Students entering Butler as transfer students and declaring pre-pharmacy as their intended major are not eligible for admission to the P1 year of the pharmacy program via the automatic advancement option. Pre-professional transfer students, as well as Butler University students not classified as pre-pharmacy upon entry into the University as first-year students (including changes of majors), may apply for admission into the P1 class on a competitive, space-available basis. Applications are available

from the Student Affairs Office (Pharmacy and Health Sciences Building, room 102). This process considers the student's cumulative GPA for all coursework completed at all universities, completion of a standardized writing prompt, and an attribute assessment through an interview.

## Requirements

- Students are required to complete the program of study with a minimum of 210 credit hours (213 credit hours for first-year students matriculating beginning in 2015).
- Successful completion of the professional curriculum requires that the student not exceed five hours of coursework with earned grades less than C (2.0) in PX and RX courses numbered 300 or higher. Additionally, the student's professional GPA must be 2.0 or higher. The professional curriculum consists of those courses designated PX and RX. The proper sequence of courses must be maintained and the prerequisites for each course satisfied. The student is responsible for making certain that he or she has completed all required courses in the curriculum.
- All didactic coursework, all earned IPPE hours (Introductory Pharmacy Practice Experience), and University Core Curriculum requirements must be completed before beginning the advanced experiential rotations (APPE) in the P4 year of the curriculum.
- Only students admitted to and currently enrolled in the professional pharmacy program of the College of Pharmacy and Health Sciences may register for courses offered as part of the curriculum numbered with RX designators. Such students must maintain their eligibility to continue in the pharmacy program.

## Student Learning Outcomes

- Apply knowledge and skills to make appropriate decisions regarding the safe and effective use of medications or the need for referral to other health care providers. These decisions should include consideration of social, economic, and cultural factors.
- Find, understand, analyze, evaluate, and use information to make informed and rational decisions.
- Effectively communicate pharmaceutical and health-related information and collaborate with other health care professionals to ensure the provision of quality patient care.

- Practice independent learning and modify ideas and behaviors based on newly acquired knowledge.
- Manage pharmacy operations including human, facilities, and fiscal resources to deliver quality patient care.
- Demonstrate ethical conduct in personal and professional settings and respect and exhibit empathy for patients' differences, values, and preferences.
- Promote health improvement, wellness, and disease prevention.

## Curriculum for First-Year Students Matriculating Beginning 2015

The College reserves the right to change the Doctor of Pharmacy curriculum at the discretion of the faculty.

<b>First Year—Pre-Pharmacy</b>	<b>Credit Hours</b>
<i>Courses (Fall Semester)</i>	
FYS101, First Year Seminar	3
CH105, General Chemistry	5
BI105, Intro Cell Biology	3
Core (TI, PCA, or SW)*	3
Liberal Education Elective	3
PX100, Health Sciences Seminar	1
<b>Total Semester Hours</b>	<b>18</b>

<i>Courses (Spring Semester)</i>	
FYS102, First Year Seminar	3
CH106, General Chemistry	5
MA106, Calc and Analytical Geom I	5
Core (TI, PCA, or SW) *	3
PWB, Physical Well-Being	1
<b>Total Semester Hours</b>	<b>17</b>

\* TI = Texts and Ideas, PCA = Perspectives in the Creative Arts, SW = Social World. Students (except previously degreed students) must take at least one core course in each of the divisions listed.

<b>Second Year—Pre-Pharmacy</b>	<b>Credit Hours</b>
<i>Courses (Fall Semester)</i>	
GHS201–209, Global and Historical Studies	3
PX326, Human Anat & Physiol 1	4
CH351, Organic Chemistry	5
PX325, Ethical Issues in Health Care	3
PX281, Intro to Pharm Sciences 1*	3
<b>Total Semester Hours</b>	<b>18</b>

<i>Courses (Spring Semester)</i>	
GHS201–209, Global and Historical Studies	3
BI325, Pathogenic Microbiology	3
CH352, Organic Chemistry	5
PX327, Human Anat & Physiol 2	4
PX282, Intro to Pharm Sciences 2*	3
<b>Total Semester Hours</b>	<b>18</b>

\* Professional phase transfer applicants should contact COPHS regarding possible PX281 and PX282 equivalencies.

### First Professional Year (Third Year) Credit Hours

#### Courses (Fall Semester)

RX316, Pathophysiology	4
BI323, Immunology	2
RX361, Pharm Practice & Health Admin 1	3
#RX381, Pharmaceutics 1: Dosage Forms	4
#RX383, Pharmacy Skills Lab 1	2
#RX391, Clinical Biochemistry for Health Sci	3
Total Semester Hours	18

#### Courses (Spring Semester)

RX362, Pharm Practice & Health Admin 2	3
#RX382, Pharmaceutics 2: Adv Dosage Forms	4
#RX384, Pharmacy Skills Lab 2	2
#RX392, Prin of Med Chem & Pharmacology	3
#RX394, Molec Genetics, Genomics, & Bioinformatics	3
Core (TI, PCA, or SW)	3
Total Semester Hours	18

### Second Professional Year Credit Hours

#### Courses (Fall Semester)

RX461, Pharm Practice & Health Admin 3	3
#RX471, Therapeutics 1	4
#RX473, Integ Cases & Prof Skills Lab 1	3
#RX481, Intro P'Kinetics & Biopharmaceutics	3
#RX491, Prin of Drug Action 1	3
Total Semester Hours	16

#### Courses (Spring Semester)

RX462, Pharm Practice & Health Admin 4	3
#RX472, Therapeutics 2	4
#RX474, Integ Cases & Prof Skills Lab 2	3
#RX492, Prin of Drug Action 2	3
RX6xx, Professional Elective	2
Liberal Education Elective	3
Total Semester Hours	18

### Third Professional Year Credit Hours

#### Courses (Fall Semester)

#RX561, Pharm Practice & Health Admin 5	3
#RX571, Therapeutics 3	4
#RX573, Integ Cases & Prof Skills Lab 3	3
#RX591, Prin of Drug Action 3	3
RX6xx, Professional Elective	3
Total Semester Hours	16

#### Courses (Spring Semester)

#RX562, Pharm Practice & Health Adm 6	3
#RX572, Therapeutics 4	4
#RX574, Integ Cases & Prof Skills Lab 4	3
#RX592, Prin of Drug Action 4	3
RX6xx, Professional Elective	3
Total Semester Hours	16

# = Tentative Planned Course Numbers

### Fourth Professional Year

RX 650–699—10 Experiential	
On-Site Rotations (4 hours each)	40
6 Required Pharmacy Rotations	
• 1 General Medicine Rotation	
• 2 Acute Care Rotations	
• 2 Community Pharmacy Rotations	
• 1 Ambulatory Care Rotation	
4 Elective Rotations (maximum of 2 non-patient-care electives)	

Total credit hours required for graduation: 213

### Curriculum for First-Year Students Matriculating Before 2015

The College reserves the right to change the doctor of pharmacy curriculum at the discretion of the faculty.

### First Year—Pre-Pharmacy Credit Hours

#### Courses (Fall Semester)

FYS101, First Year Seminar	3
CH105, General Chemistry (with lab)	5
MA106, Calc and Analytical Geom I	5
Core (TI, PCA, or SW)*	3
PX100, Health Sciences Seminar	1
Total Semester Hours	17

#### Courses (Spring Semester)

FYS102, First Year Seminar	3
CH106, General Chemistry (with lab)	5
BI105, Intro Cell Biology	3
Elective	1
Core (TI, PCA, or SW) *	3
PWB, Physical Well-Being	1
Total Semester Hours	16

### Second Year—Pre-Pharmacy Credit Hours

#### Courses (Fall Semester)

GHS201–209, Global and Historical Studies	3
PX326, Human Anat & Physiol 1	4
CH351, Organic Chemistry (with lab)	5
PX325, Ethical Issues in Health Care	3
Core (TI, PCA, or SW)*	3
Total Semester Hours	18

#### Courses (Spring Semester)

GHS201–209, Global and Historical Studies	3
BI325, Pathogenic Microbiology	3
CH352, Organic Chemistry (with lab)	5
PX327, Human Anat & Phys 2	4
PX200, Intro to Pharmacy Practice	1
Total Semester Hours	16

\* TI=Texts and Ideas, PCA=Perspectives in the Creative Arts, SW=Social World. Students (except previously degreed students) must take at least one core course in each of the divisions listed.

<b>First Professional Year (Third Year)</b>	<b>Credit Hours</b>
<i>Courses (Fall Semester)</i>	
RX312, Clinical Biochemistry	4
RX316, Pathophysiology	4
BI323, Immunology	2
RX361, Pharm Practice & Health Admin 1	3
Liberal Education Elective	3
Total Semester Hours	16

<i>Courses (Spring Semester)</i>	
RX314, Pharmaceutical Biotechnology	3
RX318, Intro to Principles of Drug Action	5
RX362, Pharm Practice & Health Admin 2	3
RX324, Clinical Assessment	2
RX351, Basic Pharmaceutics	4
Total Semester Hours	17

<b>Second Professional Year</b>	<b>Credit Hours</b>
<i>Courses (Fall Semester)</i>	
RX403, Therapeutics 1 Case Studies	1
RX411, Prin of Drug Action 1	4
RX413, Therapeutics 1	3
RX415, Self-care and Health Promotion 1	2
RX421, Introduction to Dosage Forms	4
RX461S, Pharm Pract & Health Admin 3	3
Total Semester Hours	17

<i>Courses (Spring Semester)</i>	
RX404, Therapeutics 2 Case Studies	1
RX412, Prin of Drug Action 2	4
RX414, Therapeutics 2	3
RX416C, Self-care and Health Promotion 2	3
RX422, Advanced Dosage Forms	4
RX462, Pharm Practice & Health Admin 4	3
Total Semester Hours	18

<b>Third Professional Year</b>	<b>Credit Hours</b>
<i>Courses (Fall Semester)</i>	
RX432, Personnel & Financial Mgmt	3
RX503, Therapeutics 3 Case Studies	1
RX511, Principles of Drug Action 3	4
RX513, Therapeutics 3	3
RX522, Pharmacokinetics and Biopharmaceutics	3
RX6xx, Professional Electives	3
Total Semester Hours	17

<i>Courses (Spring Semester)</i>	
RX500, Intro to Exper Rotations	1
RX517W, Therapeutics & Case Studies 4	4
RX523, Clinical Pharmacokinetics	3
RX526, Pharmacy, Policy, and the Law	3
Liberal Education Elective	3
RX6xx, Professional Electives	2
Total Semester Hours	16

<b>Fourth Professional Year</b>	<b>Credit Hours</b>
RX 650–699–6 Required Pharmacy Rotations	24
• 1 General Medicine Rotation	
• 2 Acute Care Rotations	

• 2 Community Pharmacy Rotations	
• 1 Ambulatory Care Rotation	
4 Elective Rotations (maximum of 2 non-patient-care electives)	16
RX607, PharmD Senior Seminar I	1
RX608, PharmD Senior Seminar II	1
Total Hours	42

Total credit hours required for graduation: 210

## Doctor of Pharmacy with Pharmaceutical Sciences Research Emphasis

The elective pharmaceutical sciences research track within the doctor of pharmacy curriculum will provide students an opportunity to participate in pharmaceutical sciences-focused research. The track comprises 12 credit hours of pharmaceutical sciences research, at least two credit hours of independent study, and two credit hours of pharmaceutical sciences research seminar topics. The research activity will be completed in a pharmaceutical sciences laboratory and will be performed under the direct supervision of a COPHS faculty member.

### Student Learning Outcomes

- Conduct a thorough literature review and write a concise summary of the literature relevant to a research project using appropriate critical-thinking and analysis skills
- Using one or two laboratory techniques, conduct laboratory experiments with sufficient proficiency so as to function with minimal supervision
- Generate, evaluate, and interpret experimental data using the principles of scientific research integrity
- Create and present an oral presentation summarizing the background, methods, results, and conclusions of the conducted research

### Curriculum

#### Years 1–3 as above

<b>Second Professional Year</b>	<b>Credit Hours</b>
<i>Courses (Fall Semester)</i>	
RX403, Therapeutics 1 Case Studies	1
RX411, Prin of Drug Action 1	4
RX413, Therapeutics 1	3
RX415, Self-care and Health Promotion 1	2
RX421, Introduction to Dosage Forms	4
RX461S, Pharm Practice & Health Admin 3	3
RX601/602 Independent Study	1–2
Total Semester Hours	18–19

<i>Courses (Spring Semester)</i>	
RX404, Therapeutics 2 Case Studies	1
RX412, Prin of Drug Action 2	4
RX414, Therapeutics 2	3
RX416C, Self-care and Health Promotion 2	3
RX422, Advanced Dosage Forms	4
RX462, Pharm Practice & Health Admin 4	3
RX601, Independent Study (optional)	1
Total Semester Hours	18–19

### Third Professional Year Credit Hours

<i>Courses (Fall Semester)</i>	
RX432, Personnel & Financial Mgmt	3
RX503, Therapeutics 3 Case Studies	1
RX511, Principles of Drug Action 3	4
RX513, Therapeutics 3	3
RX522, Pharmacokinetics and Biopharmaceutics	3
RX6xx, Pharmaceutical Science Elective	2–3
RX634, Seminars in Pharm Sci	1
Total Semester Hours	17–18

<i>Courses (Spring Semester)</i>	
RX500, Intro to Exper Rotations	1
RX517W, Therapeutics & Case Studies 4	4
RX526, Pharmacy, Policy, and the Law	3
RX523, Clinical Pharmacokinetics	3
Liberal Education Elective	3
RX601/602, Indep Study or Pharm Sci Electives	1–2
RX633, Current Topics in Pharm Sci	1
Total Semester Hours	16–17

### Fourth Professional Year Credit Hours

3 Research Rotations** (12 weeks total)—May through July	12
7 Patient Care Rotations	28
<ul style="list-style-type: none"> <li>• 1 General Medicine</li> <li>• 2 Acute Care</li> <li>• 1 Ambulatory Care</li> <li>• 2 Community Practice</li> <li>• 1 Patient Care Elective</li> </ul>	
RX607, PharmD Senior Seminar I	1
RX608, PharmD Senior Seminar II	1
Total hours	42

\*\* Prerequisite for research rotations: grade of C or better in research track basic science courses; all three research rotations are to be completed consecutively.

Total credit hours required for graduation: 212

## Doctor of Pharmacy with Patient Care Research Emphasis

The elective patient care research track within the doctor of pharmacy curriculum will provide students an opportunity to participate in patient-care focused research. The track comprises 12

credit hours of patient care research, at least two credit hours of independent study, and two credit hours of patient-care research seminar topics. The research activity will be completed in a clinical practice setting and will be performed under the direct supervision of a COPHS faculty member.

### Student Learning Outcomes

- Conduct a thorough literature review and write a concise summary of the literature relevant to a research project using appropriate critical-thinking and analysis skills
- Generate, evaluate, analyze, and interpret patient-care data using the principles of scientific research integrity
- Prepare and submit an IRB application or complete an IRB continuing review for the research project
- Use knowledge gained through independent study and research seminar courses to conduct a patient-care research study with minimal supervision
- Create and present a written manuscript and oral presentation summarizing the background, methods, results, and conclusions of the conducted research

### Curriculum

#### Years 1–3 as above

### Second Professional Year Credit Hours

<i>Courses (Fall Semester)</i>	
RX403, Therapeutics 1 Case Studies	1
RX411, Prin of Drug Action 1	4
RX413, Therapeutics 1	3
RX415, Self-care and Health Promotion 1	2
RX421, Introduction to Dosage Forms	4
RX461S, Pharm Practice & Health Admin 3	3
RX601/602 Independent Study	1–2
Total Semester Hours	18–19

<i>Courses (Spring Semester)</i>	
RX404, Therapeutics 2 Case Studies	1
RX412, Prin of Drug Action 2	4
RX414, Therapeutics 2	3
RX416C, Self-care and Health Promotion 2	3
RX422, Advanced Dosage Forms	4
RX462, Pharm Practice & Health Admin 4	3
Total Semester Hours	18

### Third Professional Year Credit Hours

<i>Courses (Fall Semester)</i>	
RX432, Personnel & Financial Mgmt	3
RX503, Therapeutics 3 Case Studies	1
RX511, Principles of Drug Action 3	4
RX513, Therapeutics 3	3
RX522, Pharmacokinetics and Biopharmaceutics	3



RX6xx, Professional Elective	2-3
RX634, Seminars in Pharm Sci	1
Total Semester Hours	17-18

#### Courses (Spring Semester)

RX500, Intro to Exper Rotations	1
RX517W, Therapeutics & Case Studies 4	4
RX526, Pharmacy, Policy, and the Law	3
RX523, Clinical Pharmacokinetics	3
Liberal Education Elective	3
RX6xx, Professional Elective	3
RX633, Current Topics in Pharm Sci	1
Total Semester Hours	17

#### Fourth Professional Year Credit Hours

Rotations	
3 Patient Care Research Rotations	12
7 Patient Care Rotations	28
• 1 General Medicine	
• 2 Acute Care	
• 1 Ambulatory Care	
• 2 Community Practice	
• 1 Patient Care Elective	
RX607, Pharm D Senior Seminar I	1
RX608, PharmD Senior Seminar II	1
Total hours	42

Total credit hours required for graduation: 212

## Doctor of Pharmacy with Medical Spanish Emphasis

Pharmacy students may declare the medical Spanish track upon successful completion of RX617, Advanced Medical Spanish. Students must formally register for the track by adding it as a minor using the Butler University Major/Program Change Form. Successful completion of the medical Spanish track requires a minimum of 12 credit hours of medical Spanish coursework having the RX course designator. The 12 credit hours must include an APPE rotation with a Spanish-language focus. RX617, Advanced Medical Spanish, or permission of the instructor, is a prerequisite for the APPE rotation.

### Student Learning Outcomes

- Effectively communicate with Spanish-speaking patients to elicit an accurate medical history, including relevant drug information
- Effectively communicate in Spanish (both verbal and written) to provide requisite drug information to Spanish-speaking patients
- Effectively incorporate his or her understanding of Hispanic/Latino cultural influences into patient care activities, including therapeutic recommendations and patient counseling activities with Hispanic/Latino patients

## Curriculum

The following courses may be used to satisfy completion of the medical Spanish track:

RX615, Introduction to Medical Spanish (3 credit hours)
RX617, Advanced Medical Spanish (3 credit hours)
RX619, Medical Spanish Service Learning (3 credit hours) (The service-learning portion of this course is currently completed at Alivio Clinic or an equivalent learning experience.)
RX611-68, Spanish Language Immersion trip to Mexico (100-300 level) (3 credit hours)
RX6xx, APPE rotation with Spanish language emphasis

## Doctor of Pharmacy/Master of Business Administration

[www.butler.edu/cophs/dual-degrees](http://www.butler.edu/cophs/dual-degrees)

In collaboration with the College of Business, the College of Pharmacy and Health Sciences offers the PharmD/MBA dual degree upon simultaneous completion of the respective degree requirements. See website for detailed information.

## Doctor of Pharmacy/Master of Science in Pharmaceutical Sciences

[www.butler.edu/cophs/dual-degrees](http://www.butler.edu/cophs/dual-degrees)

One of the factors that limit many doctor of pharmacy (PharmD) students from pursuing advanced degrees is the time commitment of eight or nine years required to complete the PharmD degree, plus an advanced pharmaceutical sciences degree. The objective of this program is to provide students with a time- and financially-efficient way to meet their professional goals. The curriculum for the PharmD/MS dual degree integrates the existing curricula of the PharmD and the MS in pharmaceutical sciences.

The PharmD degree allows students to work in many facets of the practice of pharmacy. Offering a PharmD/MS dual degree allows PharmD students to pursue additional training in the area of pharmaceutical sciences research. Having a PharmD/MS dual degree aids in the recruitment and retention of outstanding pharmacy students with a strong interest in research, and makes graduates more competitive for positions in the pharmaceutical industry or for academic positions.

## Years 1–3 as above

### Summer Research Following P1 Year

Students will engage in summer research and receive independent study credits (five credits). The intention is to have students get started on their respective projects. The summer research experience will last the entire summer.

### Second Professional Year Credit Hours

#### *Courses (Fall Semester)*

RX403, Therapeutics 1 Case Studies	1
RX411, Prin of Drug Action 1	4
RX413, Therapeutics 1	3
RX421, Introduction to Dosage Forms	4
RX415, Self-Care and Health Promotion 1	2
RX461S, Pharm Practice & Health Admin 3	3
RX634, Seminars in Pharmaceutical Sci	1
RX 601, Independent Study	1
Total Semester Hours	19

#### *Courses (Spring Semester)*

RX404, Therapeutics 2 Case Studies	1
RX412, Prin of Drug Action 2	4
RX414, Therapeutics 2	3
RX416C, Self-Care and Health Promotion 2	3
RX422, Advanced Dosage Forms	4
RX462, Pharm Practice & Health Admin 4	3
RX633, Current Topics in Pharm Sci	1
RX601, Independent Study	1
Total Semester Hours	20

### Entry into the graduate program

### Summer Research Following P2 year

RX 705/706 Research and Thesis	3
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### Third Professional Year Credit Hours

#### *Courses (Fall Semester)*

RX432, Personnel & Financial Mgmt	3
RX503, Therapeutics 3 Case Studies	1
RX511, Prin of Drug Action 3	4
RX513, Therapeutics 3	3
RX522, Pharmacokinetics and Biopharmaceutics	3
RX713, Biostatistics and Research Design	3
RX781, Seminars in Pharmaceutical Sci	1
RX783, Intro Pharmaceutical Research	2
Total Semester Hours	20

#### *Courses (Spring Semester)*

RX500, Intro Experiential Rotations	1
RX517W, Therapeutics & Case Studies 4	4
RX523, Clinical Pharmacokinetics	3
RX526, Pharmacy, Policy, and the Law	3
Liberal Education or Graduate-Level Electives	5
RX701, Research and Thesis	1
RX785, Biopharmaceutical Analysis	3
Total Semester Hours	20

### Fourth Professional Year Credit Hours

3 Graduate-Level Research Rotations	12
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7 Patient Care Rotations	28
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- 1 General Medicine Rotation
- 2 Acute Care Rotations
- 2 Community Pharmacy Rotations
- 1 Ambulatory Care Rotation
- 1 Patient Care Elective Rotation

RX607, PharmD Senior Seminar I	1
RX608, PharmD Senior Seminar II	1
RX782, Ethics in Research	1
RX780, Current Topics	1
Total Semester Hours	44

Completed thesis to be submitted May of graduating year.

Total credit hours required for graduation: 232

## Pharmacy Licensure and Experience Requirements

To become a licensed pharmacist in Indiana, a person must obtain a passing grade on the North American Pharmacy Licensure Examination (NAPLEX) or, with Pharmacy Board approval, reciprocate an existing license that was obtained through examination in another state. To qualify for the NAPLEX examination, a person must be a graduate of an ACPE-accredited pharmacy program, be at least 18 years of age, and be of good moral character. Persons convicted of a felony may not be eligible for licensure in Indiana. In order to participate in the experiential portion of the curriculum, students are required to submit the results of a background check for felony and/or misdemeanor convictions conducted by an independent agency. Students may be restricted from participating at certain experiential sites as a result of this information.

## Master of Science in Pharmaceutical Sciences

[www.butler.edu/cophs/ms-pharmaceutical-sciences](http://www.butler.edu/cophs/ms-pharmaceutical-sciences)

The College of Pharmacy and Health Sciences offers the master of science in pharmaceutical sciences in five areas of emphasis: pharmaceuticals, pharmacology, medicinal chemistry, pharmacy administration, and clinical sciences. The mission of the program is to educate students for pursuing research careers in the pharmaceutical/biomedical industry or in academia, and/or in obtaining advanced degrees.

## Admission

Applicants are required to possess a basic degree in chemical, biological, or pharmaceutical sciences, or other appropriate degrees. Following admission, any applicant identified to be deficient by the Research and Graduate Review

Committee with a bachelor's-level background in chemical or biological sciences will be required to take courses in the respective areas in addition to the MS in pharmaceutical sciences requirements.

## Requirements

- Bachelor's degree in appropriate discipline with a minimum 3.0 GPA or equivalent (official transcript required).
- Aptitude tests (official scores must be received from Educational Testing Services).
- Test of English as a Foreign Language (TOEFL) (not required of anyone with a U.S. bachelor's degree). A TOEFL score of 213 (computer-based test), or 79 (internet-based test) meets Butler University's English language proficiency requirements. Butler's TOEFL school code is 1073.
- Graduate Record Examination (GRE) score. The minimum GRE cutoff score for admission for each year will be determined by the Research and Graduate Review Committee.
- Brief résumé.
- Personal statement indicating a specific area of research interest and career goals.
- Three letters of recommendation evaluating the applicant's ability to complete the program successfully.
- International students must meet the financial independence criteria established by the University.

Each applicant is evaluated based on a comprehensive review of undergraduate transcripts, statement of purpose, letters of recommendation, previous research experience, and GRE score. International applicants will be interviewed over the telephone, and domestic candidates may be invited for a campus interview. Quality publications or other scholarly experience, although not required, serve to strengthen the application. For international students, admission is valid subject to obtaining appropriate visa credentials. Meeting minimum admission requirements does not ensure admission.

The admission process follows two steps: preliminary inquiry and formal application with required nonrefundable fees. The response to the preliminary inquiry will be issued by either the Butler University Office of Admission or the Department of Pharmaceutical Sciences; however, the formal application can only be made to the Office of Admission. After initial screening, the Office of Admission will forward the eligible applications to the Department of

Pharmaceutical Sciences for the decision. The director of the COPHS graduate program, in discussion with the interested research faculty, will send the recommendations to the Office of Admission.

## Student Status

**Full-time:** A full-time student must take a minimum of nine and a maximum of 12 credits of graduate-eligible courses per semester. If a graduate student is registered only for research and thesis courses (RX701–RX706) that apply toward the completion of the research projects, the student is considered to be enrolled full time, although the number of credits enrolled may be below the normal full-time course load. A Reduced Course Load authorization form must be submitted by F-1 graduate students under any circumstance when such students are taking fewer than nine credits. A maximum of four years is allowed to complete all the degree requirements.

**Part-time:** Working professionals may pursue the MS in pharmaceutical sciences on a part-time basis. The conditions are:

- Applicants must comply with all admission requirements.
- Professionals admitted into the program must take a minimum of three credits per semester and complete all degree requirements within a maximum of seven years, with the didactic coursework being completed within five years of entry into the program.
- Research toward the MS thesis must be independent of research projects ongoing at the student's place of employment and must be publishable under an affiliation with Butler University.
- Research must be conducted during the course of the program.
- Part-time students will not be eligible for any financial assistance from Butler University.
- The research advisor must be a full-time COPHS faculty member.

## Financial Assistance

The College of Pharmacy and Health Sciences does not normally provide scholarships or tuition waivers for MS students. Depending on the availability of external funding, a limited number of partial-tuition stipends in the form of graduate assistantships will be provided to qualified, full-time graduate students conducting research in COPHS laboratories. Graduate assistants will be required to work up to 20 hours per week on campus on projects assigned by the Director

of the Graduate Program, subject to valid immigration status. A full-time student must maintain a minimum cumulative GPA of 3.0 and show satisfactory progress in his or her research project to qualify for financial assistance. Tuition stipends will be competitively awarded every year, with previously awarded students given preference. Graduate assistantships will be limited to a two-year period for each recipient. Each student is required to pay regular tuition or discounted tuition and maintain approved health insurance during the course of study. There is no assurance of financial assistance for any admitted applicant.

The freedom to leave the program, for any reason and at any time, will be available to all students; however, untimely withdrawal from the program causes financial and emotional distress to the University community. Therefore, to protect the University's investment, it is the policy that any student accepting the tuition stipend as a graduate assistant is expected to complete the MS program. Any such student leaving the program prior to completion and without compelling reasons will be required to pay back the full amount of the stipend that has been awarded by the University, with the only exception being compelling medical reasons.

## Curriculum

The master's program is an intensive curriculum of didactic courses and thesis research. Successful completion of the MS in pharmaceutical sciences degree will require at least 30 semester credit hours with not fewer than six hours of research credit. The findings of the research must be compiled into a thesis and defended with an oral presentation and an oral examination by the thesis committee. Coursework is as follows:

### Required Core Courses for Emphasis Areas of Pharmaceutics, Pharmacology, and Medicinal Chemistry (total 12 credits)

RX780, Current Topics in Pharm Science* (2 semesters)	1
RX781, Seminars in Pharm Sci* (2 semesters)	1
RX782, Ethics in Research	1
RX783, Introduction to Pharm Research	2
RX784, Exp Design & Data Analysis	2
RX785, Biopharmaceutical Analysis	3

\* Each student will be enrolled in one credit hour of Current Topics in Pharmaceutical Sciences or Seminar in Pharmaceutical Sciences per semester, for a minimum of four total credits in the program. Each student is required to present at least two seminars as part of his or

her master's program, one of which may be the thesis defense. Students must enroll in RX781 during the semester in which their seminar presentation will take place, and RX780 during the remaining semesters. Regardless of the course in which the student is enrolled, all graduate students are required to attend all graduate seminars presented in COPHS.

### Elective Courses (minimum six credits)

RX630, Advanced Toxicology	3
RX632, Drug Abuse—Pharmacol, Chem, and Soc Aspects	3
RX729, Cancer Pharmacology	3
RX787, Industrial Pharm: Pref/Prod Dev	3
RX786, Advanced Drug Delivery	3
RX788, Molecular Biology/Pharmacology	3

Additional elective courses will be included as per the recommendation of the Research and Graduate Review Committee.

Deficiencies in curricular background may be addressed by requiring appropriate undergraduate courses as determined by the thesis committee and/or director of the graduate program. Additional coursework and/or research credits to fulfill the requirements of the MS degree will be determined by the thesis committee.

## Academic Progress

The Research and Graduate Review Committee will evaluate the academic progress of MS students. Master's students must maintain a minimum cumulative GPA of 3.0 for satisfactory continuation of study. Students with a cumulative GPA below 3.0 will be placed on probation. Any appeal for non-research course grade disputes and/or disciplinary action should be submitted to the Research and Graduate Review Committee. A decision can be appealed to the COPHS Academic and Professional Affairs Committee. A decision of the thesis committee on the thesis and the thesis defense will be considered final.

A grade of incomplete will be assigned for Research and Thesis (RX701–RX706) at the end of the respective semester until the thesis defense is complete, as it is difficult to justify the research outcomes based on the student's performance for a particular semester.

## Research Proposal

A research proposal summarizing the goals, objectives, and timeline of the research project must be submitted within one year of admission. The proposal must be approved by the thesis committee and the director of the graduate program.

## Classified or Proprietary Study

Each MS student is required to submit a thesis and present an open seminar on his or her research findings. In addition, the student is required to disseminate the research findings at national meetings and submit manuscript(s) for publication. Therefore, in order to protect the student's interest, it is not advisable to involve him or her in any classified or proprietary research.

## MS Thesis

Each student is required to submit a thesis prepared on the research findings. The thesis should be compiled following the format provided.

## Publication

The research project should aim at publication of the findings in peer-reviewed research journals and submission of the work as preliminary data for extramural funding by the research advisor.

## Thesis Defense

The student will present an open seminar and appear for an oral examination by the thesis committee. The committee will recommend the graduation of the student to the faculty and to the dean of COPHS subject to satisfactory completion of the didactic courses and other requirements. A student failing in the open seminar or the oral examination may appear for a second opportunity to complete the specific part of the thesis defense.

## Student Ownership of Intellectual Property

For students who help create a copyrightable work or patentable invention with one or more University employees (faculty and/or staff), the following guidelines from the University's Intellectual Property Manual may help determine when the University has certain rights in a work or invention the student has been involved in producing while at Butler. If the work or invention was created or conceived with the "substantial use" of University resources, then the work or invention may be subject to University ownership and control, with the student and/or faculty member having certain rights as described in the University Intellectual Property Policy.

For example, rights in a patentable invention arising from a student's participation in a faculty research project that makes "substantial use" of University resources will be owned by the University, with any income from the patents

being shared between the University, faculty, and student as set forth in the University Intellectual Property Policy. The policy thereby establishes the means and incentive for commercialization of the invention. The rights vest with the University. However, the ownership of copyrightable works that are not produced at the direction of the University, even those created with "substantial use" of University resources, will generally continue to be owned by the creators of the work with some rights being reserved for the University.

While the above is a general overview with some examples, do not hesitate to ask a faculty member for guidance, or refer to the Butler University Intellectual Property Manual, at [www.butler.edu/birs](http://www.butler.edu/birs), for specific guidelines. Additionally, the Butler Institute for Research and Scholarship is a valuable resource to help with questions related to these matters, and can help ensure that any intellectual property is properly protected and given the best opportunity to be commercialized.

## Master of Physician Assistant Studies

[www.butler.edu/physician-assistant](http://www.butler.edu/physician-assistant)

The College of Pharmacy and Health Sciences offers a master of physician assistant studies (MPAS) degree for those completing the requirements of the physician assistant (PA) program. Physician assistants are well-recognized and highly sought-after members of the health care team. Working interdependently with physicians, PAs provide diagnostic and therapeutic patient care in virtually all medical specialties and settings. They take patient histories, perform physical examinations, order laboratory and diagnostic studies, develop patient treatment plans, and provide patient education. In all 50 states, PAs have the authority to write prescriptions.

PAs practice in all specialty fields; 33 percent of all PAs provide primary care services, especially in family and general internal medicine. Their job descriptions are as diverse as those of their supervising physicians, and also may include nonclinical roles such as medical education, health administration, and research. While these positions do not involve patient care, they depend on a strong clinical knowledge base.

The MPAS curriculum is 24 consecutive months designed to provide an understanding of the knowledge, skills, and attitudes used as a physician assistant. The first 12 months of the MPAS program are devoted to didactic studies in the basic medical, clinical, and behavioral

sciences, and the remaining 12 months are largely focused on the clinical experiences in primary care, medical, and surgical specialties.

The didactic curriculum is integrated to introduce the student to medical sciences as they relate to specific organ systems and clinical problems. Learning strategies include the traditional lecture format and basic science laboratory, hybrid, small-group tutorials, and patient case discussions. Regular patient contact is an important part of the first-year curriculum. Students begin to see patients during the didactic year. Standardized patient evaluations, through simulation and actors, are also a part of the didactic curriculum. As part of the clinical curriculum, students participate in rotations and didactic coursework. Students are required to take core rotations in emergency medicine, family medicine, general surgery, internal medicine, mental health, pediatrics, and women's health. Students also choose an elective rotation. In the clinical year, students also participate in Core Topics, Issues of Professional Practice, and the Summative Practicum.

### Goals/Student Learning Outcomes

- Select highly qualified applicants through the admission process, who will successfully complete our physician assistant program
- Provide a quality educational experience that provides students with the knowledge, skills, and attitudes for entry-level practice as physician assistants
- Provide an educational experience that prepares our graduates to provide primary care in a wide variety of clinical settings
- Help our students develop a sensitivity that will allow them to effectively work with patients who are different than themselves
- Maintain our status as the longest accredited PA program in the state of Indiana
- Promote professionalism, service, and leadership of students and faculty

### Eligibility and Admission

There are two admission pathways to gain entry to the PA program: the direct admit pathway and the standard admission pathway. After reading the information regarding the admission process, contact [PAadmissions@butler.edu](mailto:PAadmissions@butler.edu) for any additional questions.

#### Direct Admit Pathway

The direct admit pathway, designed for incoming University first-year students who wish to become physician assistants, is a competitive process. Students will complete a bachelor of

science (four-year) degree in health sciences (BSHS). This degree is designed to meet all PA program prerequisites and provide a strong foundation for a career in a health profession. Students selected in this pathway who successfully complete all requirements will be offered a seat in the PA program. These students will not be required to complete the standard admissions process (AE or NAE evaluations).

Students within the direct admit pathway are required to fulfill all criteria listed below to maintain eligibility for direct admission. A student who fails to meet any of these requirements will lose direct-admit status, but will be able to apply to the PA program using the standard admission process. The requirements are:

- Maintain a cumulative GPA of 3.4 at Butler University by January 15 of year of matriculation
- Earn no grade of C- or less in any course on first attempt
- Complete the BSHS degree by the end of the fifth academic year from start of matriculation
- Maintain full-time enrollment during fall and spring semesters
- Remain free of conduct code violations (per COPHS and Butler University policies)

*Interested Applicants.* To be admitted via the direct admit pathway, applicants will be required to meet the minimum entry requirements for Butler University and the College of Pharmacy and Health Sciences with regard to GPA and standardized test scores (SAT/ACT). The minimum entry requirements are 3.3 GPA, 1200 SAT, and/or 26 ACT. However, the average GPA for those actually being accepted is 4.18 on a 4.0 scale; the mean ACT is 31.5 and the mean SAT is 1274. The Office of Admission also considers a student's nonacademic involvement (e.g., early application, extracurricular involvement, service, discernment, personal statement, etc.). The number of students admitted to this program will be approximately 30 per year, and offers of admission will be based on a competitive process. Students should apply to Butler University as a senior in high school and identify that they are interested in applying to the PA program as a direct admit student. It is strongly recommended that applications be submitted as early in the admissions process as possible, as offers are extended in a modified rolling admission process. Questions should be directed to Aimee Rust-Scheuermann at [arust@butler.edu](mailto:arust@butler.edu) in the Office of Admission.

## Standard Admission Pathway

Students not meeting the direct admit pathway criteria may apply to the standard admission pathway. Admission to the Butler University physician assistant program requires online application through the Central Application Service for Physician Assistants (CASPA), at [portal.caspaonline.org](http://portal.caspaonline.org). The application is available from April 17. In addition to completing and submitting the web-based application by August 1, candidates must also submit:

- CASPA application fee.
- Official transcripts from all colleges/universities (including Butler University) and other post-secondary institutions attended. A baccalaureate degree from an accredited institution is required. College seniors are eligible to apply, provided they receive the baccalaureate degree prior to the May starting date for the PA program.
- Graduate Record Exam (GRE) scores (general test) submitted no later than August 1 for the year prior to matriculation (Butler University's GRE Code: 1073). No other test scores are accepted in lieu of the GRE. Scores must be sent directly from Educational Testing Services to Butler University.

The standard admission pathway comprises an academic evaluation and a nonacademic evaluation, described below. Note: The PA program has the right to change interview processes as it deems appropriate.

*Academic Evaluation.* The academic evaluation (AE) is determined through a combination of collegiate GPA based on any college course at the 200 level or above and the composite GRE score. These items are weighted, and candidates are rank-ordered based on these markers. The top AE candidates are selected for an on-campus nonacademic evaluation. Rankings from the AE will be zeroed, and candidates moving into the next phase will be considered equal at the start of the nonacademic evaluation.

The minimum eligible overall GPA for coursework is 3.4. The median GPA for those students matriculating each year is dependent on the cohort; however, in 2014, it was 3.77. The PA program currently does not use a minimum GRE score; however, the current mean score is 308. The GRE score must be provided to CASPA at the time of application.

*Nonacademic Evaluation.* Multiple mini-interviews are used in the nonacademic evaluation (NAE). Candidates complete a series of task-oriented stations that are evaluated by PA program faculty, alumni, active preceptors,

and/or community-based PAs. The stations are designed to demonstrate characteristics necessary to be successful within the program and/or discernment appropriate for the PA profession.

## Special Considerations

- The Butler University PA program recognizes the special heritage to our profession provided by the U.S. Armed Services. A minimum of one seat in the program will be “reserved” for either a veteran or active military member (Active Duty, Reserve, and National Guard). The military candidate must meet all minimum AE criteria and must complete the NAE.
- While the program does not require health care experience for consideration of admission, it is recommended to help with the discernment process.
- International students are important to the fabric of the Butler student community; however, no special consideration is granted for an international student. If you are a student planning to study in the United States under an F-1 or J-1 visa, we hope you will consider Butler University. International students must have a TOEFL score and evaluation of any international transcripts. Please note that this takes additional time, and that deadlines will not be extended for these purposes. A TOEFL score of 550 (paper-based test), 213 (computer-based test), or 79 (internet-based test) meets Butler University's English language proficiency requirements. Butler's TOEFL school code is 1073. Contact Emily Robison at [erobison@butler.edu](mailto:erobison@butler.edu) for additional guidance and/or questions.

*Offers of Admission.* After the NAE process, selected candidates will be extended a conditional offer of admission into the Butler University PA program. The candidate will have one week from the date of the offer to either accept or reject the seat. The candidate must meet all University and PA program prerequisites and requirements. Upon acceptance of the offer, the candidate will have one additional week to provide a nonrefundable \$1,000 deposit to secure admission.

## Background Check

Candidates offered admission to the Butler physician assistant program will undergo a criminal background check during orientation and at least once during enrollment. Continuation within the program is dependent on an acceptable background check that

would allow completion of the program and credentialing requirements.

### **Application Timeline**

The PA program has the right to change timelines as it deems appropriate; however, the following timeline should provide guidance to interested applicants. Contact PAadmissions@butler.edu for additional admission questions.

April 17: CASPA application available

August 1: All material must be received and verified by CASPA

August 1–September 1: Academic evaluation of candidates

Mid-October (generally): Nonacademic evaluations

Following NAE: Offers of admission to top candidates extended until class filled

### **Prerequisites**

Students must complete the following course prerequisites with a grade of C or better to be considered for admission to the PA program. Earned Advanced Placement exam scores of 4 or 5 may substitute for prerequisite courses. Scores less than 4 are not acceptable. Appropriate earned AP scores may replace no more than two prerequisite courses. Applicants should submit copies of exam scores to PAadmissions@butler.edu.

#### *Chemistry*

- Inorganic (general) with lab (2 semesters)
- Organic with lab (1 semester)
- Additional chemistry course at or above 300 level (1 semester)

#### *Biology*

- Any biology-related course at or above 200 level (5 semesters). Examples might include but are not limited to anatomy, physiology, kinesiology, genetics, microbiology, immunology, physics, bioengineering, biomedical science, exercise science, neuroscience, zoology, and nutrition.

#### *Statistics/Biostatistics*

- Any course (1 semester)

#### *Social Sciences*

- Psychology or sociology courses or combination (2 semesters)

For information about transfer credits and course equivalencies, contact the PA program at PAadmissions@butler.edu.

### **Degree Requirements**

Students are required to complete 108 semester hours to be awarded the MPAS degree. The proper sequence of courses must be maintained.

The student is responsible for making certain that he or she has completed all required courses in the curriculum. The curriculum is offered in two sections (didactic and clinical years) that are individually indivisible and to be taken in an uninterrupted sequence over two years. Therefore, it is expected that students first matriculated into the AP- or MPAS- didactic year will maintain simultaneous enrollment in all courses offered as a component of each year's curriculum. Students may not progress to the coursework in the next year of the program until they have successfully completed all courses within the current year. PA students must earn a grade of B- or better in all courses. PA students may be dismissed from the College following failure of any two AP- or MPAS-designated courses, in addition to not adhering to the policies listed in the COPHS Student Handbook.

A PA student, after presenting a written request to the dean of the College (with a copy to the PA program director), may be granted an official leave of absence for personal, medical, or academic reasons for a period not to exceed one calendar year. If the leave of absence is approved, the dean provides written notification including applicable beginning and ending dates to the student, the University registrar, and the director of the Office of Financial Aid. The student must notify the program director in writing of his or her wish to return to the program or to extend the personal leave at least 60 calendar days prior to the anticipated date of reentry. The student desiring an extension beyond one calendar year may be required to apply for readmission to the program. When a leave of absence is taken, the program director may require the student to repeat some or all of the courses completed prior to the leave of absence. In all cases of leave of absence, the student is required to complete the full curriculum to be eligible to earn the BS and/or MPAS degree.

Any student who is absent from clinical rotations for three months or more must perform and pass an observed history and physical examination (on a real or simulated patient) before being allowed to return to clinical rotations. The student will have two opportunities, evenly spaced over a two-month period of time, to pass this assessment. If unsuccessful, the student will be dismissed from the College.

For purposes of deferring repayment of student loans during a school-approved leave of absence, federal regulations limit the leave to six months. All questions regarding financial aid or student loans should be directed to the Office of Financial Aid.



## Curriculum

The program reserves the right to change the curriculum at the discretion of the faculty. A student must successfully complete all courses in each didactic semester before being allowed to advance to the next semester. Only students admitted to and currently enrolled in the PA program of the College of Pharmacy and Health Sciences may register for courses offered as part of the curriculum numbered with AP or MPAS designators. Such students also must maintain their eligibility to continue in the PA program.

## AP Curriculum—Bachelor of Science in Health Science Curriculum

Note: This curriculum is being phased out over 2015–2017 and will be replaced with a graduate-only MPAS curriculum below.

### Didactic Coursework

#### First Year Credit Hours

##### *Fall Semester*

AP301, Physiology for PAs	5
AP350, Clinical Quality Improvement 1	3
AP307, Pathophysiology 1	5
AP308, Pharmacology for PAs 1	3
AP313, Social and Behavioral Medicine	3

##### *Spring Semester*

AP302, Anatomy for PAs	4
AP309, Pathophysiology 2	4
AP310, Pharmacology 2	3
AP351, Clinical Quality Improvement 2	3

#### Second Year Credit Hours

##### *Fall Semester*

AP402, Health Care Communications 1	1
AP404, History and Physical Assessment 1	3
AP406, Diagnostic and Therapeutic Procedures 1	3
AP413, Therapeutics for PAs 1	4
AP421, Clinical Medicine for PAs 1	6
AP408, Clinical Integration	1
AP410, ECG Interpretation	1

##### *Spring Semester*

AP403, Health Care Communication 2	1
AP405, History and Physical Assessment 2	3
AP414, Therapeutics for PAs 2	5
AP417, Diagnostic and Therapeutic Procedures 2	3
AP422, Clinical Medicine for PAs 2	6
AP409, Clinical Integration 2	1

### MPAS Curriculum—Didactic Coursework

#### First Year (program initiated in May 2015)

##### *Summer Semester*

MPAS504, Human Anatomy for PAs (with lab)	4
MPAS506, Physiology for PAs	4
MPAS508, 12-Lead ECG Interpretation	1
MPAS510, Interpretation of Laboratory	

Studies for PAs	3
MPAS512, Interpretation of Imaging	
Studies for PAs	2
MPAS514, Pharmacology for PAs	4

##### *Fall Semester*

MPAS516, History and Physical Exam (with lab) 1 for PAs	3
MPAS520, Clinical Medicine and Therapeutics for PAs 1	7
MPAS524, Clinical Procedures (with lab) 1	2
MPAS528, Health Promotion, Disease Prevention, and Nutrition	2
MPAS530, Social and Behavioral Medicine	3
MPAS532, Pediatric Medicine	1
MPAS534, Health Care Communications 1	1

##### *Spring Semester*

MPAS518, History and Physical Exam (with lab) 2	3
MPAS522, Clinical Medicine and Therapeutics for PAs 2	7
MPAS526, Clinical Procedures (with lab) 2	2
MPAS550, Orthopedics and Rheumatology	1
MPAS552, Women's Health	2
MPAS538, Medical Literature	
Interpretation and Evidence-Based Medicine	2
MPAS536, Health Care Communications 2	1

### Eligibility for Clinical Year

To qualify for clinical rotations, students must have successfully completed all didactic coursework, prerequisite coursework, and other requirements (e.g., physical examination, immunity status, BLS, ACLS) before beginning clinical rotations.

### Clinical Year

The clinical phase of the program is largely composed of four- or eight-week core rotations. Core rotations include behavioral medicine, emergency medicine, family medicine, internal medicine, general surgery, and women's health. Pediatrics, also a core rotation, is three weeks in length. At the conclusion of each core rotation, students will be required to take an examination. There is not an associated exam with the elective rotation. There is one four-week limited-elective rotation. All questions regarding rotations for PA students should be directed to the Office of Experiential Education.

### Advising and Registration

Students must participate in early advising for clinical rotations. Further, students must be officially registered for all clinical rotations/experiences for the professional liability insurance policy carried by the University to cover them in the clinical portion of the curriculum. Students participating on rotations/experiences without registering will be referred

to the Academic and Professional Affairs Committee for appropriate action (e.g., warning, probation, suspension, dismissal).

### End-of-Rotation Examinations

The Butler University PA program faculty utilizes the Physician Assistant Education Association (PAEA) written End of Rotation (EOR) Examinations and endorses the objectives utilized to develop these exams as imperative to enter into practice as a physician assistant. Students will take an examination at the end of each supervised clinical practice experience.

In order to be permitted to sit for the required EOR exam, each student must:

1. Successfully complete the required rotation as scheduled
2. Complete patient encounter logs using E-Value by noon on the day preceding the EOR meeting
3. Complete the E-Value student evaluation of the preceptor by noon on the day preceding the EOR
4. Receive approval from the director of experiential education and/or program director

Failure to meet the above requirements may result in a report to the Academic and Professional Affairs Committee for appropriate action (e.g., warning, probation, suspension, dismissal).

### Clinical Year Coursework

All rotations must be completed. Individual student rotation schedules will be determined by the director of experiential education and are subject to change at any time. Rotations are assigned within a designated radius of Butler University. Students are responsible for providing their own transportation to these sites. Topic lists are provided to direct student learning and should be used in combination with the objectives of the end-of-rotation examinations.

MPAS626, Issues of Professional Practice	2
MPAS630, Pediatric Rotation	3
MPAS634, Elective Rotation (Pass/Fail)	4
MPAS636, Summative Practicum (Pass/Fail)	1
MPAS648, Family Medicine Rotation 1	4
MPAS650, Internal Medicine 1 Rotation	4
MPAS652, Internal Medicine 2 Rotation	4
MPAS654, Community Mental Health Rotation	4
MPAS656, Women's Health Rotation	4
MPAS658, Emergency Medicine 1 Rotation	4
MPAS660, Emergency Medicine 2 Rotation	4
MPAS662, Family Medicine 2 Rotation	4
MPAS664, Interprofessional Experience (Pass/Fail)	1
MPAS670, General Surgery Rotation	4

MPAS678, Core Topics 1 (Pass/Fail)	2
MPAS680, Core Topics 2 (Pass/Fail)	2
MPAS682, Core Topics 3 (Pass/Fail)	2
Clinical curriculum: 53 credit hours	

Total program curriculum: 108 credit hours

## Licensure and Experience Requirements

Physician assistants who graduate from an accredited program must pass the Physician Assistant National Certifying Exam (PANCE), administered by the National Commission on Certification of Physician Assistants, and receive licensure from the state where they wish to practice.

## Bachelor of Science in Health Sciences

### Health Sciences Major

The undergraduate health sciences program (bachelor of science in health sciences, BSHS) blends basic sciences, health sciences, and health care-related courses to form an excellent foundation for students pursuing graduate programs in the health care field or non-licensed health-related careers in which an entry-level bachelor's degree is appropriate.

Beginning in 2014, incoming first-year students who qualify for the master of physician assistant studies (MPAS) direct admission program are health science majors in their undergraduate phase and must fulfill the following criteria to be eligible for direct admission into the MPAS program (see the Direct Admit Pathway information in the Eligibility and Admission Requirements portion of the Master of Physician Assistant Studies section above).

### Student Learning Outcomes

- Demonstrate ethical, professional, collaborative, and culturally sensitive behaviors within the health care setting
- Integrate knowledge and skills from natural, formal, and social sciences with health care fundamentals to solve complex problems and optimize health outcomes
- Locate, critically analyze, and apply data in a manner that supports evidence-based health care
- Communicate effectively with laypersons and health care professionals on a variety of health-related topics

## Curricular Requirements

In addition to Butler's Core Curriculum, health sciences majors earn more than 40 hours of science coursework, more than 30 hours of health care-related coursework, and at least 12 hours of elective health sciences coursework. A minimum of 120 credit hours is required for graduation. The following science courses are required, or may be used to meet science requirements: CH105/106 (or CH107), CH351/352, BI210, BI220, BI325, PX334, PX335, PH107, BI230, BI323, and RX316. Required health care courses include BSHS110, BSHS215, BSHS225, BSHS230, BSHS340, BSHS360, BSHS450, BSHS460, BSHS470, and RX647. A wide variety of courses may be used to fulfill elective course requirements. See [www.butler.edu/cophs](http://www.butler.edu/cophs) for the most detailed and up-to-date curricular information, including the extensive list of potential elective courses.

## Health Care and Business Major

(First Class Beginning Fall 2016)

The new undergraduate health care and business program is a collaboration between the College of Pharmacy and Health Sciences and the College of Business. This program is designed for students who are pursuing a career in the business of health care, as opposed to the clinical provision of health care, for which a bachelor's degree is the appropriate entry point into the workforce; or students who plan to pursue graduate programs related to health care and business.

### Student Learning Outcomes

- Demonstrate ethical, professional, collaborative, and culturally sensitive behavior in business and health care settings
- Integrate natural and social sciences and health care fundamentals with business principles
- Locate, critically analyze, and apply data in a manner that supports evidence-based health care
- Communicate effectively with laypersons and health care professionals on health- and business-related topics

## Curricular Requirements

In addition to Butler's Core Curriculum, health care and business majors earn more than 45 credit hours of health care/health science courses, more than 30 credit hours of business courses, and at least 12 credit hours of elective coursework. A minimum of 120 credit hours

is necessary for graduation. Required courses include BSHS 110, BSHS 215, BSHS 225, BSHS 230, BSHS 232, BSHS 340, BSHS 360, BSHS 450, BSHS 460, CH 105/106 (or CH107), BI105, BI325, PX326, PX327, MA125, MS100, AC203, AC204, EC231, EC346, EI201, MS264, MS265, MS377, MK380, and MK386. A wide variety of courses may be used to fulfill elective course requirements. Qualified students may be eligible for accelerated graduate programs. See [www.butler.edu/cophs](http://www.butler.edu/cophs) for the most complete and up-to-date curricular information and graduate program partnerships.

## Core Courses Offered by Pharmacy

**SW261S-RX, Health Disparities:** This course will allow undergraduate students to examine current population-level health issues and the unequal distribution of health through an introduction to the broad and exciting field of public health and health equity. The course will explore the varying historical, environmental, social, cultural, and political determinants of the health of the people of the United States, emphasizing health of vulnerable populations. It will provide students with a unique opportunity to think critically about ways of identifying and addressing current health issues and the unequal distribution of health status throughout the population. In this interactive course, students are encouraged to explore public health issues in their area of study and examine solutions for the same. (U)(3) Annually, term varies.

**TI262S, Self and Service:** In this course, students will read texts that explore the self and the concept of service. Readings will examine the world of children and senior citizens. Sample authors include Alexie, Updike, and Junot Diaz. Students will create oral and written histories of themselves and a person (child or senior) they serve. This 3-credit-hour course is designated service learning (at least 20 hours service required) with a child or senior. (U)(3) Fall.

## Pre-Professional Health Sciences Courses

**PX100, Health Sciences Seminar:** The purpose of the course is to get students involved early with the College and their major and to develop success skills that are applicable to all future learning experiences. Emphasis is placed on use of campus resources, developing communication skills, and examining career choices and options. Requisite: This course is required of all COPHS students without a previous degree. Open to COPHS students only. (U)(1) Fall.

**PX200, Introduction to Professional Practice:**

This course is designed to develop and enhance patient communication skills, professional attitudes, and independent learning. The course brings awareness of socioeconomic and cultural diversity and how it affects health outcomes. (U) (1) Fall and spring.

**PX206, Poverty and Modern Day Slavery—A Local and Global Crisis:**

This course will develop awareness and understanding of the modern day slave trade. We will cover related factors such as poverty, education, health care, and economic opportunity. Students will partner with local organizations that are working in areas of poverty serving the poor and marginalized in our society. (U)(2) Fall.

**PX281, Intro to Pharmaceutical Sciences 1:**

An introductory course sequence designed to prepare students for upper-level pharmaceutical sciences coursework. First-semester topics include radioactivity, fluid dynamics, thermodynamics, spectroscopy, solution chemistry, graphing, conversions, and basic genetics. Prerequisites: CH106 and BI105 (or equivalents). (U)(3) Fall.

**PX282, Intro to Pharmaceutical Sciences 2:**

An introductory course sequence designed to prepare students for upper-level pharmaceutical sciences coursework. Second-semester topics include basic statistical calculations, solution chemistry, functional groups in drugs and biomolecules, receptor structure and function, drug transporters, signal transduction, and neurotransmission. Prerequisite: PX281 (U)(3) Spring.

**PX325, Ethical Issues in Health Care:**

This course will provide students with an awareness of current ethics issues in health care, and an appreciation of the gravity of these issues. The associated body of knowledge will be discussed, and students will formally devise their own ethical position. Prerequisites: Pre-pharmacy 2 (no first-year students), pharmacy majors, STS majors, ethics minors, or permission of the instructor. (U)(3) Fall and spring.

**PX326, Human Anatomy and Physiology**

**1:** A two-semester lecture course without lab designed for pre-professional health students. This course begins with basic concepts and progresses through the organ systems with emphasis placed on those aspects of human anatomy and physiology that are most important to an understanding of homeostasis, pathophysiology, and disease. Prerequisite: Sophomore standing or permission. (U)(4) Fall.

**PX327, Human Anatomy and Physiology**

**2:** A two-semester lecture course without lab designed for pre-professional health students. This course begins with basic concepts and progresses through the organ systems with emphasis placed on those aspects of human anatomy and physiology that are most important to an understanding of homeostasis, pathophysiology, and disease. Prerequisite: Sophomore standing or permission. (U)(4) Spring.

**PX334, Human Anatomy and Physiology 1:**

A two-semester lecture and laboratory course designed for pre-professional health students. This course begins with basic concepts and progresses through the organ systems with emphasis placed on those aspects of human anatomy and physiology that are most important to an understanding of homeostasis, pathophysiology, and disease. Prerequisite: Sophomore standing or permission. (U)(5) Fall.

**PX335, Human Anatomy and Physiology 2:**

A two-semester lecture and laboratory course designed for pre-professional health students. This course begins with basic concepts and progresses through the organ systems with emphasis placed on those aspects of human anatomy and physiology that are most important to an understanding of homeostasis, pathophysiology, and disease. Prerequisite: Sophomore standing or permission. (U)(5) Spring.

**PX340, Public Health: Law and Policy:**

Familiarize students with the legal and policy issues involved in public health. The United States has many pressing public health issues. Students will be exposed to major public health challenges and explore the laws that surround public health issues; and understand how to balance public needs versus individual private rights. Prerequisite: Junior standing. (2)(U) Spring.

**Bachelor of Science in Health Sciences Courses****BSHS110, Introduction to Health Care:**

This introductory-level course will help prepare students for a career in health care. It will formally introduce critical-thinking and problem-solving methods necessary for future health care professionals, foster behaviors necessary for success, introduce the language of health care, discuss major forces in health care today, and explore a variety of health care professions. (U)(2) Fall and spring.

**BSHS210, Topics in Health and Wellness:**

This course will provide an in-depth exploration of key health-related topics of particular importance to college-age individuals. Topics covered in this class include nutrition, exercise, alcohol, infectious diseases, drug use/misuse, over-the-counter medications and supplements, personal safety, and chronic disease prevention. This class is designed for first-year students and sophomore students. (U)(3) Fall.

**BSHS215, Medical Terminology:** A one-semester hybrid online/classroom course designed for any student interested in learning the language of medical sciences. It is designed specifically for pre-professional health students to improve medical vocabulary, assist in future advanced science courses, and help prepare for professional school admission tests. (U)(3) Fall and spring.

**BSHS225, Interprofessional Health**

**Education:** This course emphasizes the roles and responsibilities of other health professionals and will prepare health profession students to provide care in a collaborative team. (U)(2) Fall.

**BSHS230, Health Care Administration, Health Care Systems, and Public Policy for Pre-Professional Students:**

Health care reform is centered on improving quality and access of health care while managing costs. Future health care practitioners must consider these three factors when making health care decisions and providing care. This course is intended to help the student understand the health care environment and to provide an overview of how health care administration decisions are made with a focus on policy development. (U)(2) Fall.

**BSHS232, Health Care Systems and Policy**

**2:** Health care reform is centered on improving quality and access of health care while managing costs. Students interested in combining health care and business need to have advanced awareness of health care systems and policy development. This course is intended to help these students build on the knowledge obtained in the Health Care System and Policy 1 course. Students will apply skills in policy making to specific topics. Prerequisite: BSHS230. (U)(2) Spring.

**BSHS280, Emergency Medical Technician—Basic Program:**

Designed to provide the student with the skills and knowledge to assess and manage patients who are acutely ill or seriously injured. The student will spend approximately 10–15 hours/week of self-directed time studying online material and completing assignments. In addition, the class

meets once per week to practice hands-on skills, ask questions, and interact with an instructor. Clinical requirements consist of 12 hours on an ambulance and eight hours in the emergency department. Other requirements: each student must be 18 years of age prior to attaining certification as an EMT by the State of Indiana; have a high school diploma or GED equivalent by the end of the program; prior to the beginning of the program, the student must have successfully completed an American Heart Association Health Care Provider CPR class or the American Red Cross equivalent; not have been convicted of any felony crimes; read, write, and speak the English language fluently; obtain the proper immunizations prior to doing clinical time; each student must be capable of performing all physical skills in the course. (U)(6) Summer.

**BSHS340, Introduction to Health Care Communication:**

This course explores concepts, theories, and communication skills specific to the health care setting. Interpersonal, group, and mass communication is discussed, with primary emphasis on interpersonal communication. Topics include cultural competence, health literacy, HIPAA and regulations affecting health communication, communications among health professionals and between health professionals and laymen, communicating difficult information, and communicating with difficult individuals. This course is appropriate for students desiring clinical and nonclinical careers in the health care field and will satisfy the Speaking across the Curriculum core requirement. Prerequisites: BSHS110, BSHS215, junior standing or above, enrollment in the health sciences/health care and business program or permission of the instructor. (U)(3) Fall.

**BSHS360, Health Care Ethics:** Students in this writing-intensive course will use a formalized process to examine a wide variety of ethical dilemmas encountered in health and medicine. Topics may include addiction management, allocation of limited health care resources, confidentiality, conflicts of interests, disparities in care, duty to report, end-of-life issues, informed consent/refusal, patient autonomy, pay-for-performance measures, medical tourism, quality-of-life issues, and more. Prerequisite: BSHS110, junior standing or above, or permission of the instructor. (U)(3) Fall and spring.

**BSHS450, Health Care Biostatistics:** This course is designed to prepare the health science student to apply the concepts of research design and statistical analysis within the health care

environment. Research skills developed in this course will emphasize a systematic and scientific approach to problem solving. The class will provide an overview of problem formulation, hypothesis generation, study design, measurement, data collection, and analysis. Additionally, there will be a focus on statistical concepts: descriptive analysis, univariate analysis, bivariate and multivariate analysis. This course is purposefully designed to be an appropriate course for undergraduate students pursuing either clinical or nonclinical careers in health care. Prerequisite: Junior standing or above, or permission of the instructor. (U)(3) Fall.

**BSHS460, Evidence-Based Health Care:** This course will provide students with fundamental skills related to the appropriate identification, retrieval, evaluation, and application of medical literature and promote the practice of evidence-based health care. Prerequisites: BSHS110, BSHS450, junior standing. (U)(3) Spring.

## Pharmacy and Pharmaceutical Sciences Courses

### **RX301, Introductory Pharmacy Practice**

**Experience 1:** This is a seminar course which prepares pharmacy students for entrance into advanced rotations. Topics will vary according to section and may include professionalism, HIPAA, Indiana pharmacist intern registration, criminal background check, and ACPE graduation requirements. (U)(0)(P/F) Fall.

**RX302, IPPE—Service Learning:** This is a service-learning course which prepares pharmacy students through topic discussions and independent learning for entrance into advanced rotations. This course satisfies the Indianapolis Community Requirement through completion of service in a course-designed project that connects experience in the Indianapolis community with academic learning goals within the classroom. (U)(1) Spring.

### **RX312, Clinical Biochemistry and**

**Metabolism:** The application of biochemistry to an understanding of the pathogenesis of disease and treatment including the interpretation of clinical laboratory tests. Prerequisites: CH351 and CH352 with passing grades. (U)(4) Fall.

### **RX314, Pharmaceutical Biotechnology:**

A course exploring the application of biochemical and biotechnical methods in the treatment of human disease. Topics introduced include gene expression, recombinant DNA techniques, molecular immunology, protein pharmaceuticals, peptidomimetics, antisense oligonucleotide

therapies, and gene therapies. Prerequisites: Clinical Biochemistry, Human Physiology, and Microbiology. (U)(3) Spring.

**RX316, Pathophysiology:** A study of the pathophysiologic processes underlying selected disease states with emphasis on the alteration of normal physiologic processes caused by and contributing to their condition. Diseases are selected based on their frequency, urgency, and value as a model. Prerequisites: Human Physiology and Microbiology. Prerequisite or corequisite: Clinical Biochemistry. (U)(4) Fall.

### **RX318, Intro to Principles of Drug Action:**

The course develops the concepts of how drugs produce their effects on cells and dose-effect and time-effect relationships. The chemistry and pharmacology of drugs that affect the autonomic nervous system are discussed. Prerequisites: RX312 Clinical Biochemistry, RX316 Pathophysiology. (U)(5) Spring.

### **RX320, Delivery of Health Care:**

This is a seminar course designed to introduce students to multiple aspects of health care delivery. The purpose of this class is to understand terminology associated with delivery of health care, discuss current trends/events in health care, and identify resources to allow students to track, evaluate, and respond to the health care environment as future practitioners. (U)(3) Spring.

**RX324, Clinical Assessment:** Methods of physical assessment and interviewing skills are presented. Normal anatomical, physiological, and pathophysiological processes of the human body are presented. With case illustrations, students learn selected diseases and the interrelationship between patient interview, abnormal physical, and laboratory parameters and their application to the treatment and monitoring of pharmacotherapy. Prerequisites: Clinical Biochemistry and Pathophysiology, or equivalents. (U)(2) Spring.

### **RX351, Basic Pharmaceutics and**

**Pharmaceutical Calculations:** Knowledge and skill development focused on the pharmacist's role in receiving, interpreting, preparing, compounding, and dispensing prescriptions for patients. Skills in pharmaceutical calculations are also developed. Prerequisite: P1 student in good standing. (U)(4) Fall.

### **RX352, COPHS Depart Honors for Student**

**Pharmacists:** Honors students will explore research design in the pharmaceutical sciences and/or in pharmacy practice, in preparation for work on the honors thesis. A research question

is selected and examined utilizing laboratory experimentation, clinical experimentation, and/or review of the published literature. A written summary of the question and results achieved will be assessed. Fulfills the departmental honors course requirement for the University Honors Program. (U)(1)

**RX353, Preparation for Honors Research:**

An introduction to the basic concepts and skills needed to conduct research in the pharmaceutical sciences or pharmacy practice. This course fulfills the departmental honors course requirements for the University Honors Program. Prerequisite: University Honors Program students only. (U)(2)

**RX361, Pharmacy Practice and Health Administration:**

The course introduces students to drug information, research design, statistical analysis to interpret data, multiple aspects of health care delivery, pharmaceutical care, pharmacy law, health literacy, and socioeconomic and cultural diversity and how it affects health outcomes. (U)(3) Fall.

**RX362, Pharmacy Practice and Administration 2:**

The course introduces students to drug information, research design, and statistical analysis to interpret data, multiple aspects of health care delivery, pharmaceutical care, pharmacy law, health literacy, and socioeconomic and cultural diversity and how it affects health outcomes. Prerequisite: RX361. (U)(3) Spring.

**RX401, Introductory Pharmacy Practice Experience 2:**

This seminar course prepares pharmacy students for entrance into advanced rotations. Topics will vary according to section and may include professionalism, HIPAA, Indiana pharmacist intern registration, criminal background check, and ACPE graduation requirements. Prerequisite: RX301. (P/F)(U)(0) Fall.

**RX403, Therapeutics 1 Case Studies:** This course uses a case-based approach to the development and monitoring of therapeutic plans for selected diseases. Corequisite: RX413. Prerequisite: RX324. (U)(1) Fall.

**RX404, Therapeutics 2 Case Studies:** This course uses a case-based approach to the development and monitoring of therapeutic plans for selected diseases. Corequisite: RX414. Prerequisite: RX413. (U)(1) Spring.

**RX411, Principles of Drug Action 1:** This course creates the drug knowledge base that can be applied to solve therapeutic problems of

patients. Selected drug categories are considered. Prerequisites: RX314, RX318. (U)(4) Fall.

**RX412, Principles of Drug Action 2:** This course creates the drug knowledge base that can be applied to solve the therapeutic problems of patients. Drug classes considered include cardiovascular and renal drugs, antihistamines, and nonsteroidal anti-inflammatory drugs. Prerequisites: RX314, RX318. (U)(4) Spring.

**RX413, Therapeutics 1:** A consideration of the pathophysiology and therapy of selected diseases that are commonly managed. Emphasis is placed on the provision of pharmaceutical care through the selection of appropriate therapy, therapeutic monitoring, and the prevention and identification of adverse drug reactions and interactions. Prerequisite: RX324; pre- or corequisite: RX403, RX411. (U)(3) Fall.

**RX414, Therapeutics 2:** This is a continuation of Therapeutics 1 and is a consideration of the pathophysiology and therapy of selected diseases that are commonly managed. Emphasis is placed on the provision of pharmaceutical care through the selection of appropriate therapy, therapeutic monitoring, and the prevention and identification of adverse drug reactions and interactions. Prerequisite: RX413 with a grade of C or higher; pre- or corequisite: RX 412; corequisite: RX 404. (U)(3) Spring.

**RX415, Self-Care and Health Promotion 1:** To develop, use, and evaluate self-care strategies to assist patients in assessing their health status to achieve and maintain optimal health. Topics include nutrition, exercise, immunizations, preventive screenings, vitamins, herbals, nonprescription medications, home monitoring techniques, nonpharmacological treatments, and adverse drug events (ADE) detection and reporting. Prerequisite: Second professional year standing. (U)(2) Fall.

**RX416, Self-Care and Health Promotion 2:** A continuation of Self-Care and Health Promotion 1. Prerequisite: RX415. (U)(3) Spring.

**RX421, Introduction to Dosage Forms:** This lecture and laboratory course correlates physical properties of drugs and additives to the design of solid, liquid, and semi-solid dosage forms. Prerequisite: RX351. (U)(4) Fall.

**RX422, Advanced Dosage Forms:** This course develops concepts and skills in designing and preparing rate-controlled drug delivery systems including sterile, parenteral dosage forms, and enteral nutrition formulations. Prerequisite: Introduction to Dosage Forms. (U)(4) Spring.

**RX432, Personnel and Financial Management:**

Personnel and resource management and basic accounting and marketing skills essential for pharmacy practice management. Prerequisite: P-1 standing in the professional pharmacy program. (U)(3) Spring.

**RX461S, Pharmacy Practice and Administration 3—Service Learning:**

This is a service-learning seminar course which prepares students for advanced rotations and career exploration. It develops essential skills for drug information, research design, and statistical analysis usage. It exposes students to multiple aspects of health care delivery, pharmaceutical care, and socioeconomic and cultural diversity and how it affects health outcomes. Prerequisite: RX362. (U)(3) Fall.

**RX462, Pharmacy Practice and Administration 4:**

This course continues to develop essential skills for drug information, research design, and statistical analysis usage. It exposes students to multiple aspects of health care delivery, pharmaceutical care, and socioeconomic and cultural diversity and how it affects health outcomes. Prerequisite: RX461. (U)(3) Spring.

**RX500, Introduction to Experiential Rotation:**

This is a seminar course which prepares the pharmacy student for the final year of the professional curriculum. Topics are discussed which impact the practice of pharmacy, including new treatments and delivery systems, ethics, quality/risk management, malpractice/liability insurance, informed consent, management of medical information/patient confidentiality, third-party reimbursement, and pharmacist/patient/physician relationships. Prerequisites: P-3 standing in pharmacy program and P-4 standing anticipated by May. (U)(1) Spring.

**RX501, Introductory Pharmacy Practice Experience 3:**

This is a seminar course that prepares pharmacy students for entrance into the advanced rotations. Topics will vary according to section and may include professionalism, HIPAA, Indiana pharmacist intern registration, criminal background check, and ACPE graduation requirements. Prerequisites: RX301, RX401. (P/F)(U)(0) Fall.

**RX503, Therapeutics 3 Case Studies:** A case-based approach to the development and monitoring of therapeutic plans for selected diseases. Corequisite: RX513. Prerequisite: RX414. (U)(1) Fall.

**RX511, Principles of Drug Action 3:** The course creates the drug knowledge base that

can be applied to solve therapeutic problems of patients. Selected drug categories are considered. Prerequisites: RX318 Intro to PDA, RX314 Pharmaceutical Biotechnology. (U)(4) Fall.

**RX513, Therapeutics 3:** This course is a continuation of Therapeutics 2 with emphasis placed on the selection of appropriate therapy, therapeutic monitoring, and the prevention and identification of adverse drug reactions and interactions for selected diseases. Prerequisites: RX414, RX404 with a grade of C or higher. Pre- or corequisite: RX503, RX511, RX522. (U)(3) Fall.

**RX517, Therapeutics and Case Studies 4:**

Provision of pharmaceutical care with emphasis on the selection of appropriate therapy, therapeutic monitoring, and the identification and prevention of adverse drug reactions and interactions. A case-based approach is used for the assessment, development, and monitoring of therapeutic plans for selected disease states. Prerequisites: RX 513, RX503. Corequisite: RX523 (U)(4) Spring.

**RX522, Pharmacokinetics and Biopharmaceutics:**

A consideration of the biological and physico-chemical factors that affect the delivery of a drug to its site of action in the body and the basic principles of pharmacokinetics. Prerequisites: RX412 and RX422. (U)(3) Fall.

**RX523, Clinical Pharmacokinetics:** Integrates serum drug concentrations in patients with the principles of biopharmaceutics, pharmacokinetics, and pharmacodynamics to achieve therapeutic goals for individual patients. Prerequisites: RX503, RX511, RX513, and RX522. Corequisite: RX517. (U)(3) Spring.

**RX526, Pharmacy, Policy, and the Law:**

Examines the legal constraints on pharmacy practice including state and federal laws and regulations. Laws affecting the business of pharmacy are examined along with legend drug and controlled substance laws. Issues of ordering, storage, distribution, and counseling are discussed. Policy analysis of pharmacy law issues are explored in this course. Prerequisite: P-3 standing. (U)(3) Spring.

**RX527, Biostatistics and Research Design:**

The course develops the essential skills for designing research studies and for using statistical analysis to interpret data and to communicate inferences drawn from data interpretation. Prerequisite: P3 standing in the doctor of pharmacy program. (U)(3) Fall.

**RX528, Advanced Drug Information and Literature Evaluation:**

The course develops the



skills essential for drug information retrieval and analysis and the formulating and communicating of written responses to drug information questions utilizing general references and primary literature. Prerequisites: RX513, RX527. (U/2) Spring.

**RX601, Independent Study: Pharmacy and Health Science:** An opportunity for qualified students to pursue investigative work in pharmacy and health sciences. Prerequisite: Approval of COPHS Academic Affairs Committee. Students who are on professional or University probation are not eligible for independent study. (U/G)(1) Annually, term varies.

**RX602, Independent Study: Pharmacy and Health Science:** An opportunity for qualified students to pursue investigative work in pharmacy and health sciences. Prerequisite: Approval of COPHS Academic Affairs Committee. Students who are on professional or University probation are not eligible for independent study. (U/G)(2) Annually, term varies.

**RX603, Independent Study: Pharmacy and Health Science:** An opportunity for qualified students to pursue investigative work in pharmacy and health sciences. Prerequisite: Approval of COPHS Academic Affairs Committee. Students who are on professional or University probation are not eligible for independent study. (U/G)(3) Annually, term varies.

**RX607, Doctor of Pharmacy Senior Seminar 1:** Students will improve formal presentation skills by observation and practice. Each student will prepare and present to faculty and peers a series of presentations including a formal seminar presentation and a poster presentation. Presentation preparation includes a critical review of the literature and case discussions pertaining to issues of pharmacy practice. Seminars are pass/fail offerings. Prerequisite: P-4 standing. (P/F)(U)(1) Fall.

**RX608, Doctor of Pharmacy Senior Seminar 2:** Students will improve formal presentation skills by observation and practice. Each student will prepare and present to faculty and peers a series of presentations including a formal seminar presentation and a poster presentation. Presentation preparation includes a critical review of the literature and case discussions pertaining to issues of pharmacy practice. Seminars are pass/fail offerings. Prerequisite: P-4 standing. (P/F)(U/G)(1) Spring.

**RX609, Special Topics in Pharmacy and Health Sciences:** A course allowing students to explore contemporary topics in pharmacy and health sciences. Prerequisites and corequisites are dependent on the specific topic and level of presentation. (U/G)(1) Annually, term varies.

**RX610, Special Topics in Pharmacy and Health Sciences:** A course allowing students to explore contemporary topics in pharmacy and health sciences. Prerequisites and corequisites are dependent on the specific topic and level of presentation. (U/G)(2) Annually, term varies.

**RX611, Special Topics in Pharmacy and Health Science:** A course allowing students to explore contemporary topics in pharmacy and health sciences. Prerequisites and corequisites are dependent on the specific topic and level of presentation. (U/G)(3) Annually, term varies.

**RX612, Clinical Drug Development:** This course provides students with in-depth knowledge of the pharmacist's regulatory role in drug development and clinical investigation. Prerequisite: Permission of instructor. (U/G)(2) Spring.

**RX613, Clinical Research Methods:** This course introduces students to clinical research—investigations performed on human subjects in a clinical setting. Students will develop a clinical protocol, discuss issues encountered during protocol implementation, and write an abbreviated clinical study report. This course employs a “hands-on,” application-oriented approach to learning the clinical research process. (U/G)(3) Annually, term varies.

**RX614, Integrative/Holistic Medicine:** Introduction and exposure to holistic therapies used as medical treatments. The course will focus on nonconventional therapies and their use in preventive and therapeutic therapy as well as the quality evidence to support their use. Topics include nutrition, physical activity, medication, acupuncture, herbal, and alternative medicines. Prerequisite: P1: BSHS 3 Year Standing. (U)(2) Fall and spring.

**RX615, Introductory Medical Spanish:** Course at the 200 level designed specifically for pharmacy students. The course will give the students the opportunity to become comfortable with conversational Spanish and medical terminology in various pharmaceutical contexts, illnesses, and medical conditions in the health care system. In this course, we will also approach the usage of daily Spanish language utilized by the professionals of this field. Prerequisites: SP204, permission of instructor. (U)(3) Fall and spring.

**RX616, Critical Care:** The purpose of this elective course is to develop a broad knowledge base of common critical care disease states and management strategies as they relate specifically to drug therapy. The course design will include a combination of both lecture and case-based classroom discussion with the focus being on case discussions. Prerequisite: Completion of all PharmD P-2 courses or permission of instructor. (U)(3) Annually, term varies.

**RX617, Advanced Medical Spanish:** The 300-level course is a continuation of the introductory course. At this advanced level, we continue to learn and practice how to communicate among professionals and patients in different settings as hospitals, clinics, and medical offices. Prerequisite: Completion of RX615. (U)(3) Fall and spring.

**RX618, Nutritional Support:** This course will provide exposure to the fundamentals and importance of healthy nutrition and lifestyle education in the community as well as fluids/electrolytes and specialized nutrition support in the acute setting with emphasis on management of complex patients. Prerequisite: Completion of all PharmD P-1 courses or permission of instructor (U)(3) Annually, term varies.

**RX619, Medical Spanish Service Learning:** Supervised volunteer work (25 hours) in a medical clinic where Spanish is spoken as the primary language. Clinic activity is supported by two weekly meetings for discussion, advanced medical vocabulary, and grammar. Prerequisite: Completion of 200-level Spanish course or permission of instructor. (U)(3) Annually, term varies.

**RX620, Teaching with Technology:** Students will develop their knowledge and skills as possible future teachers using instructional technology to enhance student learning. Laptop or tablet PC with wireless access to the Butler network are required in class. Prerequisite: Professional phase standing in the pharmacy or physician assistant programs. (U)(2) Fall.

**RX621, Pharmacy-Based Immunizations:** This course will prepare the student to become a certified pharmacist-immunizer through successful completion of the American Pharmacists Association Pharmacy-Based Immunization Delivery certificate training program. Prerequisite: Current fourth year pharmacy student, active CPR certification, and willingness to practice injection technique on each other. (U)(2) Fall.

### **RX622, Drug Disposition and Drug**

**Interactions:** This course will focus on the fundamentals of drug disposition, especially as they relate to drug-drug interaction, individual response to drugs, genetic composition in relation to drug response, and factors that alter the body's ability to handle drugs. Prerequisite: P3 standing or permission of instructor. (U)(3) Spring.

**RX626, The Places You'll Go—Preparing for Life After Pharmacy School:** This course starts with the principle of the popular Dr. Seuss book. Until now you may have been focused on getting through each semester or even just the next exam. But you may be starting to think about what is next. This seminar and project-based course will support you while you identify and share your personal goals and passions. Students will do in-depth investigation of traditional and nontraditional practice settings, discuss opportunities to stand out, and learn how to build mentorships. Projects include a personal reflection journal, topic research, presentation of a passion, and an interview for your dream job. This course is for students who haven't yet had a chance to focus their career interests. Prerequisite: P2 standing. (U)(2) Fall and spring.

### **RX628, Pursuit of Postgraduate**

**Opportunities:** This course will review postgraduate education opportunities for pharmacists with a focus on pharmacy residencies and fellowships. Students will learn about postgraduate opportunities within pharmacy and develop skills necessary in securing a position after graduation. A variety of learning techniques will be employed, which include lecture, class discussions, and in-class assessments. Students will be evaluated based on attendance, class participation, and completion of assignments. (U)(1) Spring.

**RX629, Cancer Pharmacology:** Molecular mechanisms of cancer etiology, diagnosis, and treatment, including carcinogenesis; comparisons between normal and cancerous tissue; oncogenes and tumor-suppressor genes; mechanisms of cancer chemotherapy; molecular approaches to cancer diagnosis and therapy; and personalized medicine. Prerequisite: RX314 or equivalent undergraduate biochemistry or genetics. (U)(3) Fall.

**RX630, Advanced Toxicology:** The principles of toxicological mechanisms of drugs and environmental chemicals in the biological systems. Prerequisite: Clinical biochemistry or equivalent, or permission of the instructor. (U/G)(3) Annually, term varies.

**RX631, Molecular Biology/Pharmacology:**

This course covers concepts of molecular biology in application to drug action and new drug development. Specific sections cover consecutive steps leading to normal and pathological gene expression, cellular signal transduction/malfunction, molecular biology of cancer, and pharmacogenomics. Course includes introduction to current research methodology and analysis of scientific data. (U)(3) Annually, term varies.

**RX632, Drug Abuse-Pharmacology, Chemistry and Social Aspects:**

This course will examine from a multidisciplinary perspective the phenomenon of the recreational use of mind-altering drugs like alcohol, nicotine, opioids, cocaine, and hallucinogens. Prerequisite: One semester of college-level biochemistry. (U/G)(3) Annually, term varies.

**RX633, Current Topics in Pharm Sci:**

Discussion of current research topics in pharmaceutical sciences. By permission only. (U)(1) Annually, term varies.

**RX634, Seminars in Pharmaceutical**

**Sciences:** Presentation of research topics in pharmaceutical sciences by graduate students, faculty, and guest speakers. By permission only. (U)(1) Annually, term varies.

**RX635, Internal Medicine Therapeutics:** A capstone experience for students in their 3rd professional year of the curriculum, covering topics encountered in a “general medicine” setting, including community, ambulatory, and inpatient hospital settings. Focus is on practical implementation of general medicine principles directed at pharmacist’s point of view. Corequisite: RX513. (U)(3) Annually, term varies.

**RX636, Cardiovascular Therapeutics:** This course will develop knowledge of treatment principles of major cardiovascular conditions with emphasis on reviewing and reading the landmark trials for why we treat cardiovascular diseases in clinical practice. Important clinical trials, treatment, guidelines, and several pharmacotherapeutic management strategies will be reviewed. Prerequisites: RX414 and RX404. (U)(3) Annually, term varies.

**RX637, Drug-Induced Diseases:** This course will introduce students to relevant adverse reactions that occur with medication therapies, focusing on identification of the drug-induced disease and evaluation of potential causes. Students will develop skills and thought processes designed to systemically evaluate disease states and understand treatment

algorithms. Corequisite: RX513. (U)(3) Annually, term varies.

**RX639, Principles of Psychiatric**

**Therapeutics:** This course builds upon skills learned in Therapeutics 3, providing broader knowledge base of psychiatric and neurologic disease states. Students will learn to provide the psychopharmacologic and therapeutic management strategies to treat these disorders and unique patient counseling skills essential to the development of patient relationships. Prerequisites: RX503 and RX513. (U)(3) Annually, term varies.

**RX640, Entrepreneurship in Life Sciences:**

Entrepreneurialism in pharmacy is a course designed for pharmacy students interested in learning more about the business of pharmacy and health care and how to assume ownership and responsibility for any position they choose to accept during their professional career, whether or not she or he technically own the venture. Prerequisite: Functional use of MS Excel. (U/G)(3) Annually, term varies.

**RX641, Pediatric Pharmacotherapy:** A course dealing with drug therapy in the pediatric population including neonates, infants, children, and adolescents. This course prepares the student to evaluate pediatric drug therapy regimens. Prerequisite: Completion of all fourth-year PharmD courses or permission of the instructor. (U/G)(3). Annually, term varies.

**RX642, Geriatric Therapeutics:** A study of the physiologic and pharmacokinetic changes that occur with aging and how these changes affect drug therapy. Management of disease will be discussed and evaluated. This course will provide the student with knowledge for making therapeutic decisions in the elderly. Prerequisite: Completion of all fourth-year PharmD courses or permission of instructor. (U/G)(3) Annually, term varies.

**RX643, Pharmacotherapy of Renal**

**Disease:** This elective course addresses key pharmacotherapy principles associated with the prevention and treatment of acute and chronic renal disease. Topics will include drug-induced acute kidney injury, contrast-induced nephropathy, renal dosing adjustments, anemia of chronic kidney disease, secondary hyperparathyroidism, and many others. Students will also tour a dialysis center. (U)(2) Fall.

**RX644, Women’s Health Issues:** This course will include discussions on health issues that primarily affect women. Topics include menopause, breast cancer, silicone

breast implants, systemic lupus, infertility, contraception, pregnancy, osteoporosis, women and heart disease, and other issues causing illness or death of women including domestic violence. Prerequisites: RX413, RX414. Pre- or corequisite: RX513. (U)(3) Annually, term varies.

**RX645, Pharmaceutical Literature:** An exploration of sources of information applicable to the pharmaceutical sciences and a systematic approach to literature searches. One class hour per week. Prerequisite: Completion of all fourth-year PharmD courses, or permission of instructor. (U/G)(1) Annually, term varies.

**RX646, Ambulatory Care:** The focus of this course will be on designing and developing ambulatory care pharmacy services, along with assessing and educating the ambulatory care patient. Students will be introduced to medication therapy management (MTM) and will be given the opportunity to interact and work with local ambulatory care pharmacists. (U)(3) Occasionally.

**RX647, Exploring Public Health:** In this interactive course, students are encouraged to examine, explore, and solve public health issues of interest and examine solutions for the same. It will allow students to think critically about how to identify and address current health issues from childhood immunizations to toxic exposures in the workplace. (U)(3) Annually, term varies.

**RX648, Infectious Disease Pharmacotherapy:** This elective course is designed to enhance the student's knowledge, skills, and experience with infectious diseases pharmacotherapy. The course will employ the use of didactic lecture, case-based topic discussion, active learning assignments, and primary literature evaluation to enhance class interaction and facilitate understanding of lecture topics. (U)(3) Spring.

**RX649, Neurobiology of Stress and Trauma:** Students will learn to understand the neuropathological effects of stress from a systems, developmental, neurochemical, cellular, and molecular perspective. This course examines the phenomenology and neurobiological mechanisms associated with stress and trauma as they relate to the topics to be covered. (U)(3) Annually, term varies.

**RX650, Academic Experience Rotation:** This rotation provides the student pharmacist with experience in the role of the doctor of pharmacy in classroom teaching and with the operations of an academic institution. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

#### **RX651, Administration and Management**

**Rotation:** This rotation provides the student pharmacist the opportunity to develop skills in fiscal, organization, and personnel management. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

#### **RX652, Advanced Ambulatory Care Rotation:**

This rotation provides the student pharmacist with further experience in application of therapeutic principles to the patient in the ambulatory setting. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

#### **RX654, Advanced General Medicine Rotation:**

This rotation stresses the pharmacist's role in proper drug therapy, patient education, drug administration techniques, and delivery of pharmacy services to hospitalized and ambulatory patients. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

#### **RX655, Prescription Compounding Rotation:**

This rotation provides the student pharmacist experience in the extemporaneous compounding of medicinal products that will be used for the treatment and/or prevention of disease in humans. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX656, Alt Comp Med Rotation:** This rotation provides the student pharmacist with experience in the use of herbal, probiotic, nutritional, and other alternative modalities. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX657, Ambulatory Care Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients receiving care in the ambulatory medicine clinic. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX658, Cardiology Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who have cardiovascular disorders. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

#### **RX660, Patient Care Research Rotation:**

This rotation will provide students a blended opportunity for patient care and clinical research. Students will have the opportunity to utilize problem-solving skills in the application of therapeutic principles to patient care while stressing time-management and project-management techniques. Students will have a hands-on experience in patient-care research and will conduct a patient-care research study with minimal supervision. Students will expand

their ability to generate, evaluate, analyze, and interpret patient-care data using the principles of scientific research integrity. Prerequisite: P4 standing, patient care research track. (U/G)(4) Fall, spring, and summer.

**RX661, Community Practice Rotation:** This course is concentrated on the basic operational skills necessary for practice in a community pharmacy setting. The primary focus of activities will be on distribution and workflow in a community setting. (U)(4) Fall, spring, and summer.

**RX662, Critical Care Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients whose health is in critical condition. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX664, Drug Information Rotation:** This rotation enhances the student's skills in communication, both verbal and written, and the student's skills in the retrieval, evaluation, and provision of drug-related information. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX665, Emergency Med/Trauma Rotation:** This rotation provides the student pharmacist with experience in the special needs of patients receiving care in the emergency department. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX666, General Medicine Rotation:** A hospital-based rotation utilizing faculty experienced in general internal medicine and/or family practice. The goal of this general rotation is to familiarize the student with those disease processes routinely managed by internal medicine and family practice in the acute care setting. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX667, Geriatric Medicine Rotation:** This rotation stresses the role of the pharmacist in the care of the geriatric patient through interdisciplinary activity. The student will interact with other health care professionals to optimize the care of the geriatric patient. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX670, Home Health Care Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the clinical and distributive services in the home health care environment. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX671, Industrial Pharmacy Rotation:** The industrial pharmacy rotation will focus on developing an understanding of opportunities available for the pharmacist in the pharmaceutical industry. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX672, Infectious Diseases Rotation:** This rotation focuses on the proper selection of antimicrobial, antifungal, and antiviral therapy, understanding the associated disease states, patient education, and pharmacy administration issues associated with patients with infections. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX674, Long-Term Care Rotation:** This rotation is designed to develop the student pharmacist's knowledge and problem-solving skills in clinical and distributive services in the long-term care environment. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX675, Managed Care Rotation:** This rotation provides the student pharmacist experience with the medical treatment of patients in a managed care system. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX677, Neurology Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who have neurological disorders. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX678, Nutrition Support Rotation:** This rotation focuses on nutritional assessment and requirements, parenteral nutrition, enteral nutrition, nutritional support for disease states, and nutritional support in specific patient populations. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX679, Oncology Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who have a malignancy. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX680, Pharmaceutical Sciences Research Rotation:** This rotation will provide an opportunity for professional-phase pharmacy students to experience a dedicated longitudinal research experience. This rotation experience will be performed in a pharmaceutical science area. Students will expand their ability to generate, evaluate, analyze, and interpret data using the principles of scientific research integrity. Using one or two laboratory techniques, students will conduct laboratory experiments

with sufficient proficiency so as to function with minimal supervision. Students may also experience the opportunity of creating and presenting an oral presentation summarizing the background, methods, results, and conclusions of the conducted research. Prerequisite: P4 standing, pharmaceutical sciences research track. (U)(4) Fall, spring, and summer.

**RX681, Neonatology Rotation:** The rotation provides opportunities for the student pharmacist to participate in the care of neonates in the acute care setting. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX682, Pediatric Rotation:** This rotation focuses on illnesses of the pediatric population, the physiologic differences in infants and children and how this affects drug therapy, how to solve problems in pediatric therapeutics, and how to effectively communicate about pediatric issues. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX686, Pharmacy Systems/Tech Rotation:** This rotation provides the student pharmacist experience with the organization of a medication use system and the associated use of technology. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX687, Poison Control/Toxicology Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who have ingested or have otherwise been exposed to toxic substances. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX688, Pulmonary Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who have pulmonary disorders. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX689, Veterinary Medicine Rotation:** This rotation provides experience in the care of animals with an emphasis on the use of drug therapy to cure or prevent disease. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX690, Psychiatry and Neuropsychology Rotation:** This rotation is designed to provide the student experience in the specialized clinical area of psychiatry with an emphasis on the use of drug therapy in the group of patients. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX691, Radiopharmaceutical Rotation:** This rotation provides the student pharmacist

experience with the use of radiopharmaceuticals in the diagnosis and treatment of medical conditions. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX692, Indigent Care Rotation:** This rotation provides the student pharmacist with an understanding of the special considerations involved in the delivery of health care to indigent populations. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX693, Pharmacy Board and Association Rotation:** This rotation develops the student pharmacist's understanding of the organizational structure of the pharmacy board and state pharmacy associations, their daily operation, and the manner in which they influence pharmacy practice. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX694, Surgery Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who undergo surgery. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX695, Transplantation Rotation:** This rotation develops the student pharmacist's knowledge and problem-solving skills in the application of therapeutic principles to the care of patients who have undergone organ transplantation. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX696, Women's Health Rotation:** This rotation develops the student pharmacist's understanding of the special needs associated with medical conditions affecting female patients. Prerequisite: P4 standing. (U)(4) Fall, spring, and summer.

**RX698, Washington DC Rotation:** The rotation experience provides an opportunity to participate in a three-month learning opportunity in the Washington, DC, area arranged through the Butler-Washington Semester Intern Program. The experiential learning portion of this program is arranged individually based on specific student interests. The College requires that students participating in this program also enroll in P0355 or AH110/AH202 and at least one 1-credit-hour Washington seminar course. Prerequisite: P4 standing. (P/F)(U)(12). Fall, spring, and summer.

**RX699, Spec Topics: Pharmacy Practice Rotation:** An experiential course that allows students to explore new developments in delivery of pharmacy services. Rotation sites will vary depending upon the area of pharmacy practice

being investigated. Prerequisite: P4 standing. (U)  
(4) Fall, spring, and summer.

## Master of Science in Pharmaceutical Sciences Courses

**RX701, Research and Thesis:** Research toward completion of thesis in pharmaceutical sciences. Prerequisite: GPA of 3.0 or above, exclusive of research and thesis credits. (G)(1) Annually, term varies.

**RX702, Research and Thesis:** Research toward completion of thesis in pharmaceutical sciences. Prerequisite: GPA of 3.0 or above, exclusive of research and thesis credits. (G)(1) Annually, term varies.

**RX703, Research and Thesis:** Research toward completion of thesis in pharmaceutical sciences. Prerequisite: GPA of 3.0 or above, exclusive of research and thesis credits. (G)(2) Annually, term varies.

**RX704, Research and Thesis:** Research toward completion of thesis in pharmaceutical sciences. Prerequisite: GPA of 3.0 or above, exclusive of research and thesis credits. (G)(2) Annually, term varies.

**RX705, Research and Thesis:** Research toward completion of thesis in pharmaceutical sciences. Prerequisite: GPA of 3.0 or above, exclusive of research and thesis credits. (G)(3) Annually, term varies.

**RX706, Research and Thesis:** Research toward completion of thesis in pharmaceutical sciences. Prerequisite: GPA of 3.0 or above, exclusive of research and thesis credits. (G)(3) Annually, term varies.

**RX720, Teaching with Technology:** Students will develop their knowledge and skills as possible future teachers using instructional technology to enhance student learning. Laptop or tablet PC with wireless access to the Butler network is required in class. Discussion of best-practice teaching is based on current literature on this topic. Student projects and presentations form the basis of learning assessment. (G)(2) Annually, term varies.

**RX729, Cancer Pharmacology:** Molecular mechanisms of cancer etiology, diagnosis, and treatment, including carcinogenesis; comparisons between normal and cancerous tissue; oncogenes and tumor-suppressor genes; mechanisms of cancer chemotherapy; molecular approaches to cancer diagnosis and therapy; and personalized medicine. Prerequisite: RX314 or equivalent undergraduate biochemistry or genetics. (G)(3) Fall.

## RX766, Advanced Topics in

**Neuropharmacology:** Discussions and formal presentations covering basic concepts and recent advances in clinical applications of pharmacology to psychogenic disorders. Prerequisite or corequisite: Permission of instructor. (G)(1) Annually, term varies.

**RX780, Current Topics in Pharm Science:** Discussion of current research topics in pharmaceutical sciences. (G)(1) Annually, term varies.

**RX781, Seminars in Pharm Sci:** Presentation of research topics in pharmaceutical sciences by graduate students, faculty, and guest speakers. (G)(1) Annually, term varies.

**RX782, Ethics in Research:** Discussion and case-based approaches in the ethics of research, publication, and reviewing of manuscripts and grants. Include core instructional areas recommended by the NIH Office of Research Integrity. (G)(1) Annually, term varies.

**RX783, Introduction to Pharm Research:** An introduction to basic principles of pharmaceutical research including formation of hypothesis, literature search, scientific writing, and regulatory affairs. (G)(2) Annually, term varies.

**RX784, Exp Design and Data Analysis:** Approaches in experimental design and statistical analysis of data. (G)(2) Annually, term varies.

**RX785, Biopharmaceutical Analysis:** Theory and practice of bioanalytical techniques in chemical and molecular biology-based analyses. Prerequisite: BS-level background in analytical chemistry. (G)(3) Annually, term varies.

**RX786, Advanced Drug Delivery:** Critical assessment of drug carrier systems, including transport of drug molecules across membranes. Prerequisite: Instructor's permission. (G)(3) Annually, term varies.

**RX787, Industrial Pharm—Pref/Prod Dev:** Study of physicochemical principles of drugs and excipient for optimization of bioavailability. Case studies in formulation, production, and evaluation of pharmaceutical products. Prerequisite: Instructor's permission. (G)(3) Annually, term varies.

**RX788, Molecular Biology/Pharmacology:** This course covers concepts of molecular biology in application to drug action and new drug development. Specific sections cover consecutive steps leading to normal and pathological gene expression, cellular signal

transduction/malfunction, molecular biology of cancer, and pharmacogenomics. Course includes introduction to current research methodology and analysis of scientific data. (G)(3) Annually, term varies.

## **Bachelor of Science in Health Sciences Physician Assistant Didactic Courses**

**AP301, Physiology for PAs:** This course emphasizes those aspects of human anatomy and physiology that are most important to an understanding of pathophysiology, physical diagnosis of disease, interpretation of patient clinical assessment, and treatment of disease. Prerequisite: First professional year standing in the PA program. (U)(5) Fall.

**AP350, Clinical Quality Improvement 1:** This course is part one of a two-part series designed to prepare the physician assistant student to apply the concepts of research design and statistical analysis within the clinical environment. Research skills developed in this course will emphasize a systematic and scientific approach to problem solving. The course will focus primarily on clinical quality improvement designs and analysis. The class will provide an overview of the various steps of the clinical research process such as problem formulation, hypothesis generation, study design, measurement, data collection, and analysis. Additionally, there will be a focus on statistical concepts. Prerequisite: Acceptance into the professional phase of the PA Program. (U)(3) Fall.

**AP307, Pathophysiology 1:** This course will emphasize normal structure/function of human organ systems and the physiology of disease, of disordered function, or derangement of function seen in human disease. Prerequisite: First professional year standing in the PA program. (U)(5) Fall.

**AP308, Pharmacology 1:** This course provides an introduction to the principles of drug absorption, distribution, metabolism, and excretion. In addition, the course includes a study of the mechanisms underlying the therapeutic and adverse effects of drugs used to treat human disease. Prerequisite: First professional year standing in the PA program. (U)(3) Fall.

**AP313, Social and Behavioral Medicine:** Introduction in the basic counseling skills necessary to help patients cope with illness and injury, follow prescribed treatment regimens, and modify patients' attitudes and behaviors

to more healthful patterns. This includes a functional understanding of personality development, normative responses to stress, psychosomatic manifestations of illness and injury, sexuality, responses to death and dying, and behavioral patterns related to the maintenance and restoration of health. Prerequisite: Professional phase status in the physician assistant program. (U)(3) Fall.

**AP302, Anatomy for PAs:** This course emphasizes those aspects of human anatomy that are most important to an understanding of pathophysiology, physical diagnosis of disease, interpretation of patient clinical assessment, and treatment of disease. Prerequisite: Grade of C or better in AP301. (U)(4) Spring.

**AP309, Pathophysiology 2:** This course is a continuation of AP307, Pathophysiology 1. Prerequisite: Grade of C or better in AP307. (U)(4) Spring.

**AP310, Pharmacology 2:** This course is a continuation of AP308, Pharmacology 1. Prerequisite: Grade of C or better in AP308. (U)(3) Spring.

**AP351, Clinical Quality Improvement 2:** This course is part two of a two-part series designed to prepare the physician assistant student to apply the concepts of research design and statistical analysis within the clinical environment. Research skills developed in this course emphasize a systematic and scientific approach to problem solving. The course will focus primarily on clinical quality improvement designs and analysis with special attention on evidence-based medicine commonly used in clinical quality improvement students. Prerequisite: Acceptance into the professional phase of the PA Program. (U)(3) Spring.

**AP402, Health Care Communication I:** Prepares the physician assistant to do a complete history and physical examination. Prerequisite: PA fourth year standing and acceptance into the professional phase of the PA program. (U)(1)

**AP404, History and Physical Assessment I:** Prepares the physician assistant to do a complete history and physical examination. Prerequisite: PA fourth year standing and acceptance into the professional phase of the PA program. (U)(3) Fall.

**AP406, Diagnostic and Therapeutic Procedures 1:** This course will introduce the student to clinical skills of both diagnostic and therapeutic value in order to screen for, prevent, and treat disease entities. Prerequisite: Fourth-year standing in the PA program. (U)(3) Fall.



### **AP413, Therapeutics for the Physician**

**Assistant 1:** This course prepares the physician assistant to manage drug therapy for patients in certain health care settings. Prerequisite: Fourth-year standing in the PA program and corequisite of AP421 or permission of instructor. (U)(4) Fall.

**AP421, Clinical Medicine for PAs I:** The intricacies of human disease are taught through a systems approach. Each unit begins with a review of related anatomy and physiology followed by a discussion of pathophysiology signs and symptoms, diagnostic methods, and management. Prerequisite: Fourth year standing. (U)(6) Fall.

**AP408, Clinical Integration I:** This course provides students with an opportunity to manage virtual patients by applying the knowledge, skills, and attitudes developed in other professional physician assistant coursework. (U)(1) Fall.

**AP410, ECG Interpretation:** This course provides students with instruction in interpreting 12-lead electrocardiograms for heart rate, rhythm, conduction system blocks, electrical axis, hypertrophy, ischemia, injury, infarction, and miscellaneous drug, electrolyte, disease, and pacemaker effects. Prerequisite: Fourth-year standing in the PA program. (U)(1) Fall.

**AP403, Health Care Communications II:** Prepares the physician assistant student to communicate within the health care setting, a continuation of AP402. Prerequisite: Acceptance into the professional phase of the PA program. (U)(1)

**AP405, History and Physical Assessment II:** Prepares the physician assistant to do a complete history and physical examination as a continuation of AP404. Prerequisite: Acceptance into the professional phase of the PA program. (U)(3) Spring.

**AP414, Therapeutics for the Physician Assistant 2:** A continuation of AP413. This course prepares the physician assistant to manage drug therapy for patients in certain health care settings. Prerequisites: AP413 Therapeutics for PA1, AP421 Clinical Medicine for PA1, AP406 Diagnostic and Therapeutic Procedures. Corequisite: AP423 Clinical Medicine for PA2 or permission of instructor. (U)(5) Spring.

**AP417, Diagnostic and Therapeutic Procedures 2:** A continuation of AP406, Diagnostic and Therapeutic Procedures 1. This course will introduce the student to clinical skills of both diagnostic and therapeutic value in order

to screen for, prevent, and treat disease entities. Prerequisite: Fourth-year standing in the PA program. (U)(3) Spring.

**AP422, Clinical Medicine for PAs II:** A continuation of AP421. Prerequisites: AP421 Clinical Medicine for PAs I, AP406 Diagnostic and Therapeutic Procedures, AP413 Therapeutics for PAs I. (U)(5) Spring.

**AP409, Clinical Integration II:** A continuation of Clinical Integration I. (Pass/Fail). (U)(1) Spring.

## **Master of Physician Assistant Didactic Courses**

**MPAS504, Human Anatomy for PAs with Lab:** This comprehensive course is designed to provide PA students with an extensive background in human anatomy through lecture, laboratory, virtual dissection, and independent learning exercises. The course will have a clinical emphasis. Lectures and labs will emphasize anatomy and anatomic relationships significant to common clinical medicine topics and surgical procedures. (G)(4)

**MPAS506, Physiology for PAs:** This course provides a foundation of basic science in cellular physiology, biochemistry, pathology, and immunology. Normal physiology, followed by the pathophysiology of diseases important to organ system, will be presented. Function, cellular changes, and pathological changes, including inflammatory aspects, infectious conditions, and any neoplastic presentations where appropriate, will be included. (G)(4)

**MPAS508, 12-Lead ECG Interpretation:** This course provides the physician assistant student with instruction in interpreting 12-lead electrocardiograms for heart rate, rhythm, conduction system blocks, electrical axis, hypertrophy, ischemia, injury, and infarction. This course also provides instruction regarding the effects of various drugs, electrolyte disorders, diseases, and pacemakers. (G)(1)

**MPAS510, Interpretation of Laboratory Studies:** This course introduces the physician assistant student to the use and interpretation of laboratory studies used in the diagnosis, screening, and/or monitoring of disorders commonly encountered in clinical practice. (G)(3)

**MPAS512, Interpretation of Imaging Studies:** This course introduces students to the basic principles of diagnostic imaging and interpretation in the management of patients. Examination of normal imaging studies is

followed by examination and discussion of abnormalities caused by both trauma and disease. (G)(2)

**MPAS514, Pharmacology for PAs:** The goal of pharmacology is to understand the principles of drug absorption, distribution, metabolism, excretion, and mechanisms of drugs to enable the rational use of effective agents in the diagnosis and treatment of disease. Major emphasis is placed on mechanism of action, indications, adverse effects, drug interactions. (G)(4)

**MPAS516, History and Physical Exam with**

**Lab 1:** Students learn to perform history and physical examinations on patients. Normal, variations, and common abnormal findings will be introduced. An emphasis is placed on the relationship of major signs and symptoms to their physiologic or pathophysiologic origins. Students will utilize lecture, recordings, simulation, live demonstration, other students, and standardized patients. (G)(3)

**MPAS520, Clinical Medicine and Therapeutics for PAs 1:** Students are introduced to human health and disease encountered in the primary care setting. The course emphasizes a comprehensive approach including an integration of related anatomy and physiology, followed by pathophysiology, identifying risk factors, clinical findings, diagnostic methods, management including both medical and surgical, patient education, follow-up, and prevention. (G)(7)

**MPAS524, Clinical Procedures with Lab 1:** This course is the first of a two-course series that provides the physician assistant student with the knowledge and skills required to perform diagnostic and therapeutic procedures commonly performed in clinical practice. (G)(2)

**MPAS528, Health Promotion, Disease Prevention, and Nutrition:** This course emphasizes intervention strategies, public health considerations in selected disease states, immunizations, environmental health, behavioral considerations in prevention and assessment of disease and health, implications for individual and population-based patient care, nutrition, provider education, and resource utilization. (G)(2)

**MPAS530, Social and Behavioral Medicine:** This course emphasizes personality development, normative responses to stress, psychosomatic manifestations of illness, sexuality, responses to death/dying, and behavioral patterns related to the maintenance and restoration of health. It focuses on normal/

abnormal development of children, adults, and seniors; Students acquire skills in basic treatment/counseling, patient education, substance abuse, and violence screening. (G)(3)

**MPAS532, Pediatric Medicine:** This course is an introduction to common pediatric health problems from the newborn period through adolescence. The lectures focus on health promotion, disease prevention and screening, pathology identification and management, and patient education and counseling for the pediatric patient and his/her family. (G)(1)

**MPAS534, Health Care Communications 1:** This course encourages critical thought process. Students will develop interpersonal, oral, and written communication skills that result in the effective exchange of information and collaboration with patients, their families, and other health professionals. (G)(1)

**MPAS518, History and Physical Exam with Lab 2:** Students learn to perform history and physical examinations on patients. Normal, variations, and common abnormal findings will be introduced. An emphasis is placed on the relationship of major signs and symptoms to their physiologic or pathophysiologic origins. Students will utilize lecture, videotape, simulation, live demonstration, other students, and standardized patients. (G)(3)

**MPAS522, Clinical Medicine and Therapeutics for PAs 2:** Students are introduced to human health and disease encountered in the primary care setting. The course emphasizes a comprehensive approach including an integration of related anatomy and physiology, followed by pathophysiology, identifying risk factors, clinical findings, diagnostic methods, management including both medical and surgical, patient education, follow-up, and prevention. (G)(7)

**MPAS526, Clinical Procedures with Lab 2:** This course is the second of a two-course series that provides the physician assistant student with the knowledge and skills required to perform diagnostic and therapeutic procedures commonly performed in clinical practice. (G)(2)

**MPAS550, Orthopedics and Rheumatology:** Students are introduced to orthopedic and rheumatologic conditions encountered in the primary care setting. The course emphasizes a comprehensive approach including an integration of related anatomy and physiology, followed by pathophysiology, identifying risk factors, clinical findings, diagnostic methods, and management including both medical and

surgical, patient education, follow-up, and prevention. (G)(1)

**MPAS552, Women's Health:** Students are introduced to women's health issues encountered in the primary care setting, including obstetrics and gynecology. The course emphasizes a comprehensive approach including an integration of related anatomy and physiology, followed by pathophysiology, identifying risk factors, clinical findings, diagnostic methods, and management including both medical and surgical, patient education, follow-up, and prevention. (G)(2).

**MPAS538, Medical Literature Interpretation and EBM:** This course prepares physician assistant students to apply concepts of research design and statistical analysis within the clinical environment, emphasizing principles of evidence-based medicine. Research skills developed include a systematic and scientific approach to problem solving, database search techniques, interpretation of published research, and determining quality of published research to guide clinical practice decisions. (G)(2).

**MPAS536, Health Care Communications 2:** This course encourages critical thought process. Students will develop interpersonal, oral, and written communication skills that result in the effective exchange of information and collaboration with patients, their families, and other health professionals. (G)(1).

## Master of Physician Assistant Clinical Year Courses

**MPAS626, Issues of Professional Practice:** This course provides the student with an introduction to the historical development and current trends of the PA profession, reimbursement, health policy, and public health issues as they pertain to the supervised practice of clinical medicine. It also provides the student with an introduction to medical ethics, coding and billing, cultural issues, PA certification, licensure, malpractice and risk management, financial planning, and PA organizations as they pertain to the supervised practice of clinical medicine. Prerequisites: Admission into the professional phase of the PA program and completion of the didactic phase of the PA program. (G)(3) Summer.

**MPAS630, Pediatric Rotation:** This pediatric rotation is designed to provide the physician assistant student with an intense exposure of primary care pediatric problems with the objectives of developing skills in well-child preventive care and the care of common pediatric

illnesses. Prerequisite: Completion of didactic courses in PA program. (G)(3) Fall, spring, and summer.

**MPAS634, Elective Rotation:** Four-week clinical rotation designed to provide the student with an elective opportunity in any of the following disciplines: dermatology, gastroenterology, medical or surgical subspecialty, cardiology, radiology, ENT, or urology. The discipline must be approved by the clinical coordinator. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS636, Summative Practicum:** In order to graduate from the PA program, students must demonstrate competency to practice medicine as an entry-level PA in primary care. In order to do so, students must successfully complete all components of the summative examination which is comprised of clinical skills and objective structured clinical examinations. Prerequisite: Completion of didactic courses in PA program. (G)(1) Spring.

**MPAS648, Family Medicine Rotation 1:** This rotation provides students with experience to refine their skills in performing a history and physical exam, ordering and interpreting diagnostic tests, and developing treatment plans for patients. The student participates in the broad spectrum of primary care by developing skills in acute and long-term management. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS650, Internal Medicine Rotation 1:** This rotation provides students with experience in caring for adult and geriatric patients in a clinical practice setting. Students will perform history and physical examinations, obtain diagnostic testing, and present their data along with proposed differential diagnoses and treatment plans. Students may have additional requirements associated with internal medicine. Prerequisite: Completion of didactic courses in PA program (G)(4) Fall, spring, and summer.

**MPAS652, Internal Medicine Rotation 2:** This rotation provides the student with experience in caring for adult and geriatric patients in a clinical practice setting. Students will perform history and physical examinations, obtain diagnostic testing, and present their data along with proposed differential diagnoses and treatment plans. Students may have additional requirements associated with internal medicine. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS654, Community Mental Health**

**Rotation:** This rotation will provide students with an experience in caring for ambulatory or hospitalized patients with psychiatric disorders. The student will perform psychiatric evaluations and develop and support clinical management plans. Students may have additional requirements associated with community mental health. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS656, Women's Health Rotation:** Four-week clinical rotation designed to provide the physician assistant student with an opportunity to develop proficiency in the unique medical history, physical examination, and treatment of the prenatal/gynecology patient. The student will also become familiar with tests and procedures unique to this patient population. Students may have additional requirements associated with women's health. Prerequisite: Entry into the experiential year of the PA program. (G)(4) Fall, spring, and summer.

**MPAS658, Emergency Medicine 1:** This rotation is designed to provide students exposure to and development of skills in managing patients in the emergency department setting. Skills will include those necessary for triage, stabilization, diagnosis, and management of patients that present to the emergency department. Students may have additional requirements associated with emergency medicine. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS660, Emergency Medicine 2:** This rotation is designed to provide students exposure to and development of skills in managing patients in the emergency department setting. Skills will include those necessary for triage, stabilization, diagnosis, and management of patients that present to the emergency department. Students may have additional requirements associated with emergency medicine. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS662, Family Medicine Rotation 2:** This rotation provides the student with an experience to refine their skills in performing a history and physical exam, ordering and interpreting diagnostic tests, and developing treatment plans for patients. The student participates in the broad spectrum of primary care by developing skills in acute and long-term management. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS664, Interprofessional Experience:**

This course prepares the PA student to work collaboratively within interprofessional patient-centered teams upon graduation. It provides the student with an opportunity to interact, communicate, and effectively understand the various roles of other non-physician health care providers. These providers may include at a minimum physical therapists, occupational therapists, respiratory therapists, speech/language therapists, social workers, pharmacists, surgical technicians, radiologic technicians, dietitians, nurses, dentists, and various other licensed non-physician health care providers. It will give the student a better understanding of how health care workers interact with other health care workers. It will provide the student with an opportunity to learn how various health care workers provide both direct and indirect patient care to diverse patient populations and how that care fits within patient-centered teams. Prerequisites: Completion of the PA didactic curriculum and entry into the PA experiential year. (G)(1) Fall, spring, and summer.

**MPAS670, General Surgery Rotation:** This rotation is designed to prepare the physician assistant student to function as an assistant to the general surgeon in providing pre-operative, intra-operative, and post-operative care. The student will learn how to diagnose and manage common surgical disorders and learn when to make appropriate surgical referrals. Prerequisite: Completion of didactic courses in PA program. (G)(4) Fall, spring, and summer.

**MPAS678, Core Content 1:** This self-study course is designed to guide and encourage the student's systematic preparation for the Physician Assistant National Certification Examination (PANCE) by means of monthly examinations; and to develop and assess the student's competency in each of the stated terminal outcomes of the PA program. Prerequisites: Admission into the professional phase of the PA program and completion of the didactic phase of the PA program. (G)(2) Summer.

**MPAS680, Core Content 2:** This self-study course is designed to guide and encourage the student's systematic preparation for the Physician Assistant National Certification Examination (PANCE) by means of monthly examinations; and to develop and assess the student's competency in each of the stated terminal outcomes of the PA program. Prerequisites: Admission into the professional phase of the PA program and completion of the didactic phase of the PA program. (G)(2) Fall.

**MPAS682, Core Content 3:** This self-study course is designed to guide and encourage the student's systematic preparation for the Physician Assistant National Certification Examination (PANCE) by means of monthly examinations; and to develop and assess the student's competency in each of the stated terminal outcomes of the PA program. Prerequisites: Admission into the professional phase of the PA program and completion of the didactic phase of the PA program. (G)(1) Spring.