

2009-2010 Course Catalog

The University Of Montana

Skaggs School of Pharmacy

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Pharmacy is the study of the biological, chemical, and physical characteristics of medicinal substances and the utilization of these substances in the prevention, treatment, and control of illness and disease. It also encompasses a study of the systems of delivering health care and the function of the professional pharmacist within these systems.

The Skaggs School of Pharmacy was established in 1907 at Montana State College and was transferred to the University in 1913. The pharmacy program consists of two departments, Pharmacy Practice and Biomedical and Pharmaceutical Sciences.

The Skaggs School of Pharmacy is a member of the American Association of Colleges of Pharmacy. The entry-level doctor of pharmacy program is fully accredited by the Accreditation Council for Pharmacy Education, 20 North Clark Street, Suite 2500, Chicago IL 60602-5109, telephone (312) 664-3575, (800) 533-3606; FAX (312) 664-4652.

The curriculum offered by the Skaggs School of Pharmacy consists of a six year program leading to the entry-level Pharm.D. degree. The first two years, or pre-professional portion of the curriculum, are spent in studies of the basic biological and physical sciences, and in course work necessary to satisfy the University general education requirements. During the first three years of the professional program, students devote their time to the study of the biomedical and pharmaceutical sciences and pharmacy practice. Areas of study include biochemistry, microbiology, medicinal chemistry, pharmaceuticals, pharmacology, social administrative pharmacy, and therapeutics. The final professional year is entirely experiential.

A program of selected electives allows the student to obtain further educational experience in specialized areas of pharmaceutical knowledge. Students in the professional program may choose elective courses in specific areas of interest which include community pharmacy practice, management, research and teaching, or hospital and institutional pharmacy practice. All students must confer with assigned advisors prior to each registration period and receive approval of proposed courses.

In addition to their formal educational program, students, to become registered pharmacists, must complete practical experience or internship under the direction of a registered pharmacist and pass an examination given by the State Board of Pharmacy.

Career opportunities exist in the fields of community pharmacy, institutional pharmacy, federal or state government service, public health agencies, and with the

pharmaceutical industry in sales positions or in manufacturing. Those with advanced degrees are in demand for research positions and in pharmaceutical education.

High School Preparation: In addition to the general University admission requirements, algebra, trigonometry, biology, chemistry, physics and a course in computers are recommended.

Admission

The general requirements for admission to the University are listed separately in this catalog.

Pre-Pharmacy Program

The pre-pharmacy curriculum, which requires a minimum of two years of full-time study, may be taken at any accredited college or university.

Students at The University of Montana-Missoula may enter the pre-pharmacy program during any semester. It is recommended that students considering pharmacy as a major declare a pre-pharmacy major as early as possible in order to receive appropriate advising. Upon designating pre-pharmacy as a major, students will be assigned an advisor within the pharmacy program.

Professional Pharmacy Program

Students must apply for admission to the professional program. Class size in the professional pharmacy program is restricted and admission to the program is competitive. The admission process is designed to admit the best overall class into professional study. Completed applications are evaluated by the Skaggs School of Pharmacy Admissions Committee. Acceptances are made by the pharmacy faculty and the dean based on the recommendations of the committee.

Since very few elective credits are available in the professional pharmacy curriculum, students will be expected to have completed all General Education requirements except for the upper-division writing and ethics requirements prior to entering the professional curriculum. Students must complete all General Education requirements before entering pharmacy practice experience rotations during the final year of the program. Applicants will be screened based on academic record (both overall and in the required pre-pharmacy course work) and Pharmacy College Admission Test scores (refer to www.pcatweb.info for test dates). To be eligible for admission, students must have a minimum grade point average of 2.5 on a 4 point scale, both overall and in required pre-professional courses. Students must earn grades of at least a C (not C-) in all required pre-pharmacy courses. For the past several years there have been more than four applicants for each opening, and the grade point average of the entering class has been about 3.5. In addition, applicants must present proof of having completed at least 60 hours of volunteer or paid service in a pharmacy, other health care, or social field, and an evaluation form filled out by someone involved with the applicant in such an experience. A personal interview is also required.

As a state supported institution, the Skaggs School of Pharmacy gives all applicants from the Montana University System equal consideration for admission into the professional pharmacy program. There is no restriction on admission of out-of-state

students; however, Montana residents are given priority among students with equal qualifications. Students will be notified of their admission status in writing. In the past, student with only international coursework have not been admitted to the professional pharmacy program.

The curriculum of the professional pharmacy program is sequential. Therefore, students may enter the program in the autumn semester only. Application forms for admission to the professional curriculum may be obtained from the website of the College of Health Professions and Biomedical Sciences (www.health.umt.edu). Applications must be post marked by February 15 preceding the autumn semester of the year for which admission is requested.

An application fee must be submitted with the application. Admission for one academic year cannot be deferred to another academic year. Official transcripts of all academic courses taken must be forwarded directly to the Skaggs School of Pharmacy.

The professional pharmacy curriculum must be taken in residence at the University. Students transferring from other accredited schools of pharmacy may be admitted with advanced standing, determined on the basis of credits accepted, provided they are in good academic standing. Transfer credit for required professional courses taken at other institutions is accepted only for those courses which are deemed equivalent and in which a letter grade of C (2.00) or better is obtained.

Academic Progression

The general University academic standing requirements are listed separately in this catalog. See index.

Students in the professional pharmacy curriculum must maintain cumulative, professional, and pharmacy grade point averages of 2.0 or higher. The professional grade point average consists of all required course work in the professional curriculum. The pharmacy grade point average consists of all courses with a pharmacy (BMED or PHAR) prefix.

Students enrolled in the professional pharmacy program must maintain satisfactory academic progress. Students must earn grades of at least C- in all required courses in the professional pharmacy curriculum. Students in the professional program who have a pharmacy or professional grade point average of less than 2.0 or who receive a grade of D or F in any required course in the professional curriculum will be placed on academic probation. A student must petition to continue in the professional pharmacy program if he or she is on probation. A student will be dismissed from the professional pharmacy program if he or she is on probation for a total of three terms, not necessarily consecutive, subject to review by the dean. A student will be removed from probation when a grade point average of 2.0 has been achieved and all grades in required professional pharmacy courses are C- or better.

Students who have failed ten or more credits of required professional course work or who fail to progress in the expected manner for two consecutive years may be dismissed from the professional pharmacy program, subject to review by the Academic Standards Committee and the dean.

Students dismissed from the program for substandard performance will not be readmitted, except in cases where substantiation is made to the faculty, by written petition, that the substandard performance was the result of circumstances that no

longer exist, or that the student has demonstrated the capability and desire to perform satisfactory work since his or her dismissal from the program.

Students leaving the program on their own volition are guaranteed readmission if they are in good academic standing and exit by interview with the assistant dean for student affairs. Those students leaving the program on their own volition and not in good standing must reapply for admission.

The professional pharmacy curriculum consists of an integrated sequence of required courses which is designed to be completed in four consecutive years. With appropriate justification, part-time study in the professional pharmacy program may be allowed. Students desiring to be enrolled in part-time study must make their request by petition to the Academic Standards Committee. Because the curriculum is revised periodically, students who take longer than the normal number of years to complete the professional program will be required to complete curricular changes applicable to the class in which they graduate. Because the Pharmacy program is academically intense, employment beyond the minimal, part-time work is not recommended.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

Degree candidates must:

1. Meet the general University requirements for graduation.
2. Earn a grade point average of 2.0 or higher in each of the following areas:
 - a. all courses attempted at The University of Montana-Missoula (cumulative GPA).
 - b. all courses which carry a pharmacy (BMED or PHAR) prefix (pharmacy GPA).
 - c. all required courses in the professional pharmacy curriculum (professional GPA).
3. Required pharmacy course work must be completed with a grade of C- or better.
4. Complete at least six full academic years, including pre-pharmacy instruction, and a minimum of eight semesters of professional instruction as a full-time student registered for a minimum of twelve credits per semester.
5. Complete not less than 200 credits of course work.

Licensure in Montana

An applicant for licensure as a registered pharmacist in Montana must pass national examinations as required by the Montana State Board of Pharmacy. To qualify for the examinations, the applicant must be of good moral character and a graduate of an accredited school of pharmacy; however, an applicant will not receive a license until an internship is completed.

Internship Regulations

1. The internship requirement for licensure as a registered pharmacist in Montana is regulated by the Montana State Board of Pharmacy. Students must be registered with the Board of Pharmacy as a pharmacy intern in order to accrue internship hours.

2. Only those students who have completed the first year of the professional pharmacy curriculum may begin their internship.
3. The internship requirement consists of 1,500 hours of experience in an approved pharmacy setting. The student also may acquire hours concurrently with school attendance in courses, clinical pharmacy programs, or demonstration projects which have been approved by the Board of Pharmacy.
4. Many courses and programs currently offered by the School of Pharmacy are approved and applicable toward fulfilling the internship requirement.
5. Students will receive credit for internship time and/or courses taken if such experience is certified by the preceptor and/or instructor and approved by the Board of Pharmacy.

Pre-Pharmacy Curriculum

The courses shown here must be completed before entering the professional pharmacy program. The sequence of courses is illustrative and, if proper prerequisites are satisfied, the student may alter the order in which the courses are taken.

In addition, applicants to the professional pharmacy program must present proof of having completed at least 60 hours of volunteer or paid service in a pharmacy, other health care, or social field, and one letter of evaluation from someone involved with the applicant in such an experience. The Pharmacy College Admission Test (PCAT) must be taken during the second pre-pharmacy year.

Pre-Pharmacy First Year	A	S
CHMY 141N, 143N (CHEM 161N, 162N) College Chemistry I, II	5	5
M 162 (MATH 150) Applied Calculus (prereq. M 151 (MATH 121) or appropriate placement score)	4	-
ECNS 201S (ECON 111S) Principles of Microeconomics or ECNS 202S (ECON 112S) Principles of Macroeconomics	-	3
WRIT 101 (ENEX 101) English Composition	3	-
Social science elective chosen from: PSYX 100S Introduction to Psychology or SOCI 101S (SOC 110S) Introduction to Sociology	-	3
*Electives and General Education	4	5
Total	16	16

Pre-Pharmacy Second Year	A	S
CHMY 221, 222 Organic Chemistry I, Organic Chemistry I Lab	3	3
CHMY 223 Organic Chemistry II	2	-
BIOL 221 Cell and Molecular Biology (prereq., BIOL 110N or equiv.)	4	-
STAT 216 (MATH 241) Statistics or PSYX 222 (PSYC 220) Psychological Statistics or SOCI 202 Social Statistics (prereq., M 162 (MATH 150) or M 115 (MATH 117)	-	4
PHYS 111N-113N Fundamental of Physics I	-	5
Communications elective chosen from: COMM 111A Introduction to Public Speaking or DRAM 111A Acting for Nonmajors	3	-
*Electives and General Education	4	4
Total	16	16

*Students must complete the University's General Education requirements. Due to the limitation of elective credits in the professional pharmacy curriculum, students are advised to complete the lower-division General Education requirement during the pre-pharmacy curriculum.

Professional Pharmacy Curriculum

Students must apply for admission to the professional program. For requirements see the section on Admission. Students enrolled in the professional pharmacy curriculum are assessed a supplemental fee. This fee does not apply to pre-pharmacy students. Refer to the fees section of this catalog for details. Students must demonstrate proficiency in pharmaceutical calculation by successfully completing a competency assessment prior to entering the second professional year. Students, except those exempt, must complete the University Upper-Division Writing Proficiency Assessment prior to entering the second professional year.

The Upper-division Writing Requirement must be met by successfully completing PHAR 550 or an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog. See index.

First Professional Year		A	S
BIOC 380 Elementary Biochemistry	4	-	
BMED 328 Antimicrobial Agents	-	3	
BMED 331 Pharmaceutics	-	4	
BMED 341, 342 Physiological Systems I, II	4	4	
BMED 361-362 Pharmaceutical Sciences Lab	1	1	
MICB 302 Medical Microbiology	3	-	
PHAR 309 Pharmacy Practice I	3	-	
PHAR 310 Pharmacy Practice II	-	2	
PHAR 363 Pharmaceutical Care Lab I	-	1	
PHAR 371-372 Integrated Studies	1	1	
Total	16	16	

Second Professional Year Autumn/Spring Intersession:

PHAR 480 Community Pharmacy Introductory Experience	-	3	
		A	S
BMED 421, 422 Medicinal Chemistry I, II	3	3	
BMED 432 Biopharmaceutics/ Pharmacokinetics	3	-	
BMED 443, 444 Pharmacology and Toxicology	4	4	
PHAR 412 Pharmacy Practice III–Social and Behavioral Pharmacy	-	2	
PHAR 451, 452 Therapeutics I, II	3	3	
PHAR 460 Pharmaceutical Care Lab II	1	-	

PHAR 463 Pharmaceutical Care Lab III	-	1
PHAR 471, 472 Integrated Studies	1	1
Electives	1	2
Total	16	16

Third Professional Year Autumn/Spring Intersession:

PHAR 481 Hospital Pharmacy Introductory Experience	-	3		
			A	S
PHAR 505 Pharmacy Practice IV--Pharmaceutical Care	3	-		
PHAR 506 Pharmacy Practice V--Advanced Pharmaceutical Care	-	3		
PHAR 513 Pharmacoeconomics and Outcomes Research	-	3		
PHAR 514E Pharmacy Ethics	-	3		
PHAR 550 Drug Literature Evaluation	3	-		
PHAR 553, 554 Therapeutics III and IV	4	4		
PHAR 557 Public Health in Pharmacy	2	-		
PHAR 560 Pharmaceutical care Lab IV	1	-		
PHAR 563 Pharmaceutical Care Lab V	-	1		
PHAR 571, 572 Integrated Studies	1	1		
PHAR 578 Portfolio Assessment & APFE Orientation	-	1		
Total	14	16		

Fourth Professional Year A S

PHAR 579 Community Pharmacy Advanced Pharmacy Practice Experience	4	-		
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PHAR 580 Hospital Pharmacy advanced Pharmacy Practice Experience	-	4
PHAR 581 Inpatient Advanced Pharmacy Practice Experience	4	-
PHAR 582 Ambulatory Care Advanced Pharmacy Practice Experience	-	8
PHAR Elective Pharmacy Practice Experience	8	8
Total	16	20

Required credits: 200

Department of Pharmacy Practice

Michael P. Rivey, Chair

The Department of Pharmacy Practice provides academic course work for the Doctor of Pharmacy and Masters degrees, conducts research in the broad area of health care, and provides service to the profession of pharmacy and other health care disciplines.

Courses

U = for undergraduate credit only, UG = for undergraduate or graduate credit, G = for graduate credit. R after the credit indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Pharmacy (PHAR)

U 110N Use and Abuse of Drugs 3 cr. Offered autumn and spring. Drug dependence and abuse.

U 195 Special Topics Variable cr. (R-16) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 309 Pharmacy Practice I: Introduction to Pharmacy 3 cr. Offered autumn. Prereq., M 162 (MATH 150) and admission to the professional pharmacy program. An introduction to the prescription and pharmaceutical calculations and to the role of the pharmacist in systems involved in health care delivery.

U 310 Pharmacy Practice II: Law and Dispensing 2 cr. Offered spring. Prereq., PHAR 309. Federal and state laws and regulations pertaining to pharmacy practice. Introductory dispensing laboratory.

U 320 American Indian Health Issues 2 cr. Offered spring. Same as HS 320. An overview of the health issues, health care delivery and payment that affect American Indians.

UG 324 Medicinal Plants 2-3 cr. Offered autumn. Same as BMED 324 and HS 324. Plants and other natural substances which nourish, heal, injure, or alter the conscious mind.

U 363 Pharmaceutical Care Lab I 1 cr. Coreq. PHAR 310. Practice in technical and legal aspects of drug dispensing, prescription and OTC drug counseling, and sterile intravenous (IV) admixture.

U 371 Integrated Studies I 1 cr. Prereq., first professional year standing in pharmacy. Small group conferences designed to develop professional skills while integrating material from other pharmacy courses.

U 372 Integrated Studies II 1 cr. Prereq., PHAR 371. Continuation of 371.

U 380 Pharmacy Practicum 1-2 cr. (R-3) Offered autumn and spring. Prereq., PHAR 309. Supervised professional experience in the Student Health Service Pharmacy.

U 395 Special Topics Variable cr. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 397 Research 1-3 cr. (R-6) Offered autumn and spring. Prereq., consent of instr. Individual participation in library or laboratory research.

U 412 Pharmacy Practice III—Social and Behavioral Pharmacy 2 cr. Offered spring. Prereq., second professional year standing and a course in communication. The social, economic, legal, ethical, and psychological factors involved in professional and patient relationships of pharmacists.

UG 451 Therapeutics I 3 cr. Offered autumn. Prereq., second professional year standing; coreq., PHAR 471; prereq. or coreq., BMED 328, 421 and 443. Pharmacotherapeutics of common disease states emphasizing pathophysiology and the selection, monitoring, and individualization of drug therapy. Applies the basic pharmaceutical sciences to patient care.

UG 452 Therapeutics II 3 cr. Offered spring. Prereq., PHAR 451; coreq., PHAR 472; prereq. or coreq., BMED 422, 432 and 444. Pharmacotherapeutics of common disease states emphasizing pathophysiology and the selection, monitoring, and individualization of drug therapy. Applies the basic pharmaceutical sciences to patient care.

U 460 Pharmaceutical Care Lab II 1 cr. Offered autumn. Prereq., second professional year standing, PHAR 310. Introduction to parenteral practice application, applied patient interview assessment, and communication skills for practice.

U 463 Pharmaceutical Care Lab III 1 cr. Coreq. PHAR 412. Practice counseling and patient-care skills with emphasis on non-prescription drugs and devices. Includes individual in-service presentations.

U 471 Integrated Studies III 1 cr. Offered autumn. Prereq., second professional year standing in pharmacy. Small group conferences designed to develop professional skills while integrating material from first and second year professional pharmacy courses.

U 472 Integrated Studies IV 1 cr. Offered spring. Prereq., PHAR 471. Continuation of 471.

U 480 Community Pharmacy Introductory Pharmacy Practice Experience 3 cr. (R-6) Offered every term. Prereq., completion of first professional year. Supervised professional experience in community pharmacy.

U 481 Hospital Pharmacy Introductory Pharmacy Practice Experience 3 cr. (R-6) Offered every term. Prereq., completion of first professional year. Supervised professional experience in a hospital pharmacy.

UG 495 Special Topics Variable cr. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 497 Research 1-3 cr. (R-6) Offered autumn and spring. Prereq., consent of instr. Individual participation in library or laboratory research.

U 505 Pharmacy Practice IV–Pharmaceutical Care 3 cr. Offered autumn. Prereq., third professional year standing in Pharm.D. program. Applications of advanced drug therapy monitoring and disease state management.

U 506 Pharmacy Practice V–Professional Practice Management 3 cr. Offered spring. Prereq., PHAR 505. Aspects of dispensing, management, communications, disease state monitoring, and legal issues related to the provision of pharmaceutical care.

UG 513 Pharmacoeconomics and Outcomes Research 3 cr. Offered spring. Prereq., third professional year standing or consent of instr. Introduction to assessing the economic, clinical and humanistic outcomes of pharmacotherapy.

U 514E Case Studies in Pharmacy Ethics 3 cr. Offered spring. Prereq., third professional year standing or consent of instr. A practical discussion of pharmacy ethics, as it relates to pharmacy practice.

UG 516 Advanced Pharmacy Administration 2 cr. Offered intermittently. Prereq., consent of instr. Analysis of the pharmaceutical industry.

UG 550 Drug Literature Evaluation 3 cr. Offered autumn. Prereq., third professional year standing in pharmacy. Scientific and statistical evaluation of the drug and medical research literature to formulate solutions for patient-specific pharmacotherapy problems.

UG 553 Therapeutics III 4 cr. Offered autumn. Prereq., PHAR 452, 472: prereq. or coreq., PHAR 571. Pharmacotherapeutics of common disease states emphasizing pathophysiology and the selection, monitoring, and individualization of drug therapy. Applies the basic pharmaceutical sciences to patient care.

UG 554 Therapeutics IV 4 cr. Offered spring. Prereq., PHAR 553, 571; prereq. or coreq., PHAR 572. Intended for Pharm.D. students. Pharmacotherapeutics of common disease states emphasizing pathophysiology and the selection, monitoring, and individualization of drug therapy. Applies the basic pharmaceutical sciences to patient care.

UG 556 Psychopharmacotherapeutics 2 cr. Offered autumn. Prereq., PHAR 452 or consent of instr. A discussion of the more common childhood and adult psychiatric disorders with emphasis on a pharmacologic approach to their treatment.

UG 557 Public Health in Pharmacy 2 cr. Offered autumn. Prereq., PHAR 452, 472. Discussion of the roles and responsibilities of pharmacists in public health and the role of drugs in public health programs.

U 558 Physical Assessment 2 cr. Offered spring. Coreq., PHAR 554. Basic physical assessment skills for the pharmacist's proper interpretation of patient response to drug therapy.

U 560 Pharmaceutical Care Lab IV 1 cr. Coreq PHAR 505. Practice in professional communication and pharmaceutical care interventions and recommendations.

U 563 Pharmaceutical Care Lab V 1 cr. Coreq., PHAR 506. Practice in professional communication and pharmaceutical care interventions and recommendations.

UG 571 Integrated Studies V 1 cr. Offered autumn. Prereq., third professional year standing in Pharm.D. program. Small group conferences designed to develop the professional skills needed to practice pharmaceutical care while integrating material from the professional pharmacy curriculum.

U 572 Integrated Studies VI 1 cr. Offered spring. Prereq., third professional year standing in Pharm.D. program. Small group conferences designed to develop professional skills while integrating material from other pharmacy courses.

U 573 Institutional Pharmacy 3 cr. Offered autumn. Prereq., PHAR 309 and BMED 331. The pharmacist's role and activities in drug distribution and control in hospitals and related institutions with an emphasis on the preparation and administration of sterile products.

U 578 Portfolio Assessment and APPE Orientation 1 cr. Offered spring. Prereq., final semester in didactic PHARM D curriculum. Preparation and assessment of the student portfolio and orientation for the final experiential year of the professional pharmacy program.

U 579 Community Pharmacy Advanced Pharmacy Practice Experience Variable cr. (R-12) Offered every term. Prereq., completion of didactic courses in the Pharm. D. program. Supervised professional experience in the patient care functions of the pharmacist in the community pharmacy setting.

U 580 Hospital Pharmacy Advanced Pharmacy Practice Experience Variable cr. (R-12) Offered every term. Prereq. Completion of didactic courses in the Pharm.D. program. Supervised professional experience in the patient care functions of the pharmacist in the hospital pharmacy setting.

U 581 Inpatient Advanced Pharmacy Practice Experience Variable cr. (R-12) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in the clinical functions of the pharmacist in the inpatient hospital setting.

U 582 Ambulatory Care Advanced Pharmacy Practice Experience Variable cr. (R-16) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in the clinical functions of the pharmacist in the ambulatory care setting.

U 583 Drug Information Advanced Pharmacy Practice Experience 4 cr. (R-8) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in the provision of drug information by the pharmacist.

U 584 Specialized Services Advanced Pharmacy Practice Experience 4 cr. (R-8) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in specialized practice settings, such as home infusion, compounding, and nuclear pharmacies..

U 585 Geriatric Advanced Pharmacy Practice Experience 4 cr. (R-8) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience with geriatric patients in the long term care and/or other pharmacy setting.

U 586 Clinical Specialty Advanced Pharmacy Practice Experience 4 cr. (R-16) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in the clinical functions of the pharmacist in specialty settings or with specialized groups of patients.

U 587 Administrative Advanced Pharmacy Practice Experience 4 cr. (R-8) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in the administrative aspects of providing pharmaceutical care.

U 588 Research Advanced Pharmacy Practice Experience 4 cr. (R-8) Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in a research setting.

U 589 Education Advanced Pharmacy Practice Experience 4 cr. Offered every term. Prereq., completion of didactic courses in the Pharm.D. program. Supervised professional experience in teaching in a pharmacy curriculum.

UG 593 Current Research Literature 1 cr. (R-6) Offered autumn and spring. Readings and discussion of current research literature.

UG 594 Seminar 1 cr. (R-6) Offered autumn and spring. Prereq., senior or graduate standing.

UG 595 Special Topics Variable cr. (R-9) Offered intermittently. Prereq., senior or graduate standing. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

UG 596 Independent Study Variable cr. (R-9) Offered every term.

UG 597 Research Variable cr. (R-6 for undergraduates; R-10 for graduates) Offered every term. Prereq., senior or graduate standing. Individual participation in library or laboratory research.

G 599 Thesis Variable cr. (R-10) Offered every term.

G 603 Professional Practice IV–Pharmaceutical Care 4 cr. Offered autumn. Prereq., third professional year standing in Pharm.D. program and acceptance into M.B.A. program. Aspects of dispensing, management, communications, disease state monitoring, and legal issues related to the provision of pharmaceutical care.

G 604 Professional Practice V–Advanced Professional Practice 4 cr. Offered spring. Prereq., PHAR 603. Applications of advanced drug therapy monitoring and disease state.

Faculty

Professors

- Douglas R. Allington, Pharm.D., University of South Carolina, 1988
- Donna G. Beall, Pharm.D., University of Florida, 1984
- Gayle A. Hudgins, Pharm.D., Duquesne University, 1976
- William J. Docktor, Pharm.D., University of Michigan, 1977
- David S. Forbes, Ph.D., University of Wisconsin, 1973 (Dean)
- Sarah Johnston Miller, Pharm.D., Mercer University, 1985
- Lori J. Morin, Pharm D., M.B.A., The University of Montana, 1981 (Assistant Dean for Student Affairs)

- Michael P. Rivey, M.S., University of Iowa, 1982 (Chair)

Associate Professors

- Sherrill Brown, Pharm.D., University of Missouri, Kansas City, 2003
- Jean T. Carter, Ph.D., University of Arizona, 1997
- Vincent J. Colucci, Pharm.D., Idaho State University, 1995
- Lawrence A. Dent, Pharm.D., Idaho State University, 1993

Assistant Professors

- Katy Hale, Pharm.D., University of Washington, 2004
- Kendra Procacci, Pharm.D., University of Wyoming, 2004

Instructors

- Genine Thormahlen, Pharm.D., The University of Montana, 2004
- Lisa Wrobel, Pharm.D., The University of Montana, 2003

Adjunct Assistant Professors

- Lisa C. Barnes, M.B.A., The University of Montana, 1994

Department of Biomedical and Pharmaceutical Sciences

Ricahrd J. Bridges, Chair

The Department of Biomedical and Pharmaceutical Sciences offers a curriculum in support of the Doctor of Pharmacy (Pharm.D.) degree and graduate programs in the biomedical and pharmaceutical sciences. Degree programs include the M.S. in Neuroscience, Pharmaceutical Sciences, and Toxicology; and the Ph.D. in Neuroscience, Biomedical Sciences, and Toxicology. These programs provide education and training in pharmacology, toxicology, neurobiology, neurochemistry, medicinal chemistry, and molecular genetics. Program graduates are well prepared for careers in academia, government and industry.

Courses

U = for undergraduate credit only, UG = for undergraduate or graduate credit, G = for graduate credit. R after the credit indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Biomedical and Pharmaceutical Sciences (BMED)

U 145N Introduction to Cancer Biology 3 cr. Introduction to basic concepts in cancer biology, treatment, and prevention. Includes discussions of the history of cancer,

nonmenclature, prevention, cellular and molecular mechanisms, pathology, treatment, and familial cancers.

U 195 Special Topics Variable cr. (R-16) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

UG 324 Medicinal Plants 2-3 cr. Offered autumn. Plants and other natural substances which nourish, heal, injure, or alter the conscious mind.

U 328 Antimicrobial Agents 3 cr. Offered spring. Prereq., BIOC 380, MICB 302. Chemical characteristics, biochemical mechanisms, and pharmacological properties of drugs used in treating infections caused by microorganisms.

U 331 Pharmaceutics 4 cr. Offered spring. Prereq., CHEM 222, first professional year standing. Physical pharmacy and dosage forms.

U 341 Physiological Systems I 4 cr. Offered autumn. Prereq., CHEM 222, PHYS 121N, BIOL 221. Principles of anatomy, normal and abnormal physiology.

U 342 Physiological Systems II 4 cr. Offered spring. Prereq., BMED 341. Continuation of 341.

U 347 Introduction to Neuroscience 3 cr. Offered autumn. Prereq., introductory chemistry and biology. Same as BIOL 347. The molecular and cellular physiology of the human nervous system. Topics range from the basis of electrical and chemical signaling in neurons to the organization of the nervous system and its functions in generating behavior.

U 361 Pharmaceutical Sciences Laboratory 1 cr. Offered autumn. Coreq., PHAR 309, BMED 341. Laboratory experience in the pharmaceutical sciences.

U 362 Pharmaceutical Sciences Laboratory 1 cr. Offered spring. Prereq., BMED 361; coreq., BMED 331 and 342. Continuation of 361.

U 395 Special Topics Variable cr. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 397 Research 1-3 cr. (R-6) Offered autumn and spring. Prereq., consent of instr. Individual participation in library or laboratory research.

U 401 Use of Animals in Research 2 cr. Offered intermittently. Prereq., consent of faculty supervisor. An introductory course to the care and use of laboratory animals in research. Includes lecture and some hands-on instruction with inanimate models and live animals.

UG 421 Medicinal Chemistry I 3 cr. Offered autumn. Prereq., BIOC 380. The chemistry of organic compounds used medicinally and their biochemical mechanisms of action.

UG 422 Medicinal Chemistry II 3 cr. Offered spring. Prereq., BMED 421. Continuation of 421.

U 430 Pharmacogenetics 2 cr. Offered alternate years. Prereq., BIOC 380, BMED 421, 432. The genetic basis of differential drug activity.

UG 432 Biopharmaceutics and Pharmacokinetics 3 cr. Offered spring. Prereq., BMED 331 and pharmaceutical calculation proficiency requirement, or consent of instr. Drug absorption, distribution and elimination.

UG 443 Pharmacology and Toxicology 4 cr. Offered autumn. Prereq., second professional year standing. Basic principles of pharmacology, toxicology and therapeutics.

UG 444 Pharmacology and Toxicology 4 cr. Offered spring. Prereq., BMED 443. Continuation of 443.

UG 495 Special Topics Variable cr. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 497 Research 1-3 cr. (R-6) Offered autumn and spring. Prereq., consent of instr. Individual participation in library or laboratory research.

G 501 Care and use of Laboratory Animals in Research 2 cr. Offered intermittently. Prereq., consent of faculty supervisor. An introductory course to the care and use of laboratory animals in research. Includes lecture and some hands-on instruction.

G 545 Research Laboratory Rotations 2-3 cr. (R-6) Offered autumn and spring. Prereq., BMED 443 or graduate standing. Experience in research methods in departmental research laboratories.

G 581 Research Seminar in Biomedical Science 1 cr. (R-9) Offered autumn and spring. Oral and written presentations of experimental research results and selected literature topics in biomedical science.

G 582 Research Seminar in Neuroscience 1 cr. (R-9) Offered autumn and spring. Oral and written presentations of experimental research results and selected literature topics in neuroscience.

G 583 Research Seminar in Toxicology 1 cr. (R-9) Offered autumn and spring. Oral and written presentations of experimental research results and selected literature topics in toxicology.

G 593 Current Research Literature 1 cr. (R-6) Offered autumn and spring. Readings and discussion of current research literature.

G 594 Seminar 1 cr. (R-6) Offered autumn and spring. Prereq., senior or graduate standing.

UG 595 Special Topics Variable cr. (R-9) Offered intermittently. Prereq., senior or graduate standing. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

G 596 Independent Study Variable cr. (R-9) Offered every term.

G 597 Research Variable cr. (R-10) Offered every term.

G 599 Thesis Variable cr. (R-10) Offered every term.

G 600 Advanced Cellular Biochemistry 4 cr. Offered every spring. Prereq., BIOC 380 or 481, or consent of instr. Same as BIOC 600. Exploration on a molecular level the regulation of structure, function, and dynamics of eukaryotic cells. Topics include membranes, cytoskeleton, transcription, translation, signal transduction, cell motility, cell proliferation, and programmed cell death.

G 605 Biomedical Research Ethics 1 cr. Offered spring. Overview of biomedical research ethics and regulations. Topics include ethics and morality in science, scientific integrity, conflicts of interest, human and animal experimentation, intellectual property, plagiarism.

G 607 Topics in Epidemiology 1-3 cr. (R-9) Offered autumn or spring. Prereq., BMED 609 or equiv. Current topics in epidemiology.

G 609 Biomedical Statistics 3 cr. Offered autumn. Experimental design and statistical analysis relevant to the biomedical sciences.

G 610 Neuropharmacology 3 cr. Offered alternate years. Prereq., BMED 613 or 661 or consent of instr. Focus on current areas of research and research technologies in neuropharmacology. Development of presentations and research grant proposals.

G 613 Pharmacology I 4 cr. Offered autumn. Prereq., BIOC 380 or equiv. Fundamentals of pharmacology and drug action.

G 614 Pharmacology II 4 cr. Offered spring. Prereq., BMED 613. Fundamentals of pharmacology and drug action. Continuation of BMED 613.

G 615 Molecular Pharmacology 3 cr. Offered alternate years. Prereq., BMED 600, 613 or consent of instr. Focus on the molecular world of receptors and their interactions with related cellular components and ultimately with binding ligands, both physiological and pharmaceutical. Major emphasis in pharmacodynamics with some time devoted to related pharmacokinetic parameters.

G 620 Cardiovascular Pharmacology and Toxicology 3 cr. Offered alternate years. Prereq., BMED 613 or 641, or consent of instr. Recent advances in pharmacology and toxicology of the cardiovascular system. In-depth study of regulatory mechanisms and the effect of immune response and xenobiotics on cardiovascular function.

G 621 Drug Design, Development and Discovery with lab 4 cr. Offered alternate years. Prereq., Organic Chemistry and Biochemistry or consent of instr. Introduction to the main concepts in medicinal chemistry. Laboratory experience in instrumental analysis, interpreting NMR, MS cleavage, and structure elucidation.

G 622 Drug Pharmacodynamic-Drug Receptor Interactions with lab 4 cr. Offered alternate years. Organic Chemistry and Biochemistry or consent of instr. Introduction and topical coverage of how drugs form complexes with biological targets to cause an array of responses.

G 623 Drug Diversity and Target-Oriented Synthesis 3 cr. Offered alternate years. Organic Chemistry and Biochemistry or consent of instr. Topics in chemogenomics and diversity oriented synthesis will be covered.

G 625 Drug Synthesis 3 cr. Offered intermittently. An introduction to the past and current synthetic approaches and total syntheses of biologically active drugs.

G 626 Research Methods in Biochemical Pharmacology 1- 3 cr. (R-6) Offered every term. Prereq., consent of instr. Laboratory course intended to familiarize students with the instruments, and expertise of current research techniques in the biomedical sciences.

G 627 Professional Development 1 cr. Offered autumn and spring. Prereq., Organic Chemistry and Biochemistry or consent of instr. Developmental training in presentations, writing, reviewing, literature research, teaching, research methods, grant writing, ethics, and business aspects in medicinal chemistry.

G 630 Pharmacogenetics 3 cr. Offered alternate years. Prereq., BIOC 380 or 481. The genetic basis of differential drug activity.

G 632 Advanced Pharmaceutics 1-3 cr. (R-6) Offered intermittently. Advanced studies of dosage formulations, biopharmaceutics, and pharmacokinetics.

G 635 Academic Development Seminar 2 cr. Offered alternate years. Prereq., admission to graduate program. Designed to improve skills in teaching, design and implementation of hypothesis testing, and grant writing with emphasis on the biological and chemical sciences.

G 637 Topics in Biomedical Science 1-3 cr. (R-9) Offered autumn or spring. Prereq., BMED 613, or 641, or 661. Current topics in the biomedical sciences.

G 641 Toxicology I—Principles of Toxicology 3 cr. Offered autumn. Prereq., BIOC 481 or equiv. Introduction to toxicology. Topics include general principles, risk assessment, organ system toxicology, introduction to carcinogenesis, and genetic toxicology.

G 642 Toxicology II—Toxic Agents 3 cr. Offered spring. Prereq., BMED 641. Toxic agents and the diseases caused by those agents. Includes common toxicants in the environment and occupational settings as well as drug induced toxicity.

G 643 Cellular and Molecular Toxicology 3 cr. Offered autumn. Prereq., BMED 641. Cellular and molecular mechanisms of toxicity. Includes apoptosis, regulation of cell cycle, genetic toxicology, and signal transduction pathways in toxicity.

G 644 Immunotoxicology 3 cr. Offered alternate years. Prereq., MICB 410 or equiv. The impacts of xenobiotic agents on the immune system.

G 645 Respiratory Toxicology 3 cr. Offered alternate years. Prereq., BMED 641. The lung and associated immune systems and their response to inhaled immunogenic and toxicological agents.

G 646 Neurotoxicology 3 cr. Offered alternate years. Prereq., BMED 641 or 661. Mechanisms of major neurotoxins and neurological disease.

G 647 Topics in Toxicology 1-3 cr. (R-9) Offered autumn or spring. Prereq., BMED 613, or 641, or 661. Current topics in toxicology.

G 657 Topics in Immunology 1-3 cr. (R-9) Offered autumn or spring. Prereq., MICB 410 or equiv. Current topics in immunology.

G 661 Neuroscience I 4 cr. Offered autumn. Prereq., BIOC 380 or equiv. Overview of the structure and function of the nervous system.

G 662 Neuroscience II 4 cr. Offered spring. Prereq., BMED 661. Fundamentals of developmental neuroscience, behavioral and cognitive neuroscience, and computational neuroscience.

G 667 Topics in Neurobiology 1-3 cr. (R-9) Offered every year. Prereq., BMED 661. Current topics in neuroscience.

G 697 Research 1-9 cr. (R-20) Offered every term.

G 699 Dissertation 1-9 cr. (R-20) Offered every term.

Faculty

Professors

- Howard D. Beall, Ph.D., University of Florida, 1991
- Richard J. Bridges, Ph.D., Cornell University Medical College, 1987 (Chair)
- J. Douglas Coffin, Ph.D., State University of New York Health Sciences Center at Syracuse, 1989

- Vernon R. Grund, Ph.D., University of Minnesota, 1974 (Associate Dean for research and Graduate Education)
- Andrij Holian, Ph.D., Montana State University, 1975 (Director, Center for Environmental Health Sciences)
- Michael Kavanaugh, Ph.D., Oregon Health Sciences University-Portland, 1987 (Director, Center for Structural and Functional Neuroscience)
- Diana I. Lurie, Ph.D., University of Pennsylvania, 1989
- Nicholas Natale, Ph.D., Drexel University, 1978
- Charles M. Thompson, Ph.D., University of California, Riverside, 1982

Associate Professors

- Fernando Cardozo-Pelaez, Ph.D., University of Southern Florida, 1996
- Lilian Calderon-Garciduenas, M.D., Ph.D., University of North Carolina, 2001
- John Gerdes, Ph.D., University of California, Riverside, 1982
- Darrell Jackson, Ph.D., Washington State University, 1990
- Curtis W. Noonan, Ph.D., Colorado State University, 2000
- Keith K. Parker, Ph.D., University of California, San Francisco, 1977
- Mark A. Pershouse, Ph.D., University of Texas-Houston, 1993
- Elizabeth A. Putnam, Ph.D., University of Texas-Houston, 1989
- Kevan Roberts, Ph.D., Christie Hospital in Manchester, U.K., 1984
- David M. Shepherd, Ph.D., Oregon State University, 1999
- Jerry R. Smith, Ph.D., University of Mississippi, 1977

Assistant Professors

- J. Josh Lawrence, Ph.D., University of Wisconsin-Madison, 1999
- Erica L. Woodahl, Ph.D., University of Washington, 2004

Lecturer

- David S. Freeman, Ph.D., University of Washington, 1974

Research Associate Professors

- C. Sean Esslinger, Ph.D., Colorado State University, 1992
- Dianne L. DeCamp, Ph.D., University of Delaware, 1988
- David J. Poulsen, Ph.D., University of Delaware, 1995

Research Assistant Professors

- Kathleen M. George, Ph.D., Northwestern University, 1994
- Christopher T. Migliaccio, Ph.D., University of California-Davis, 2000
- Anthony Ward, Ph.D., The University of Montana, 2001

Emeritus Professors

- Todd G. Cochran, Ph.D., University of Washington, 1970
- Charles L. Eyer, Ph.D., Washington State University, 1976
- Rustem S. Medora, Ph.D., University of Rhode Island, 1965

