

SCHOOL OF MEDICINE

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Programs

- Biomedical Research, M.D./Ph.D. (<http://catalog.marshall.edu/graduate/programs-az/medicine/biomedical-research-md-phd/>)
- Biomedical Research, M.S. (<http://catalog.marshall.edu/graduate/programs-az/medicine/biomedical-research-ms/>)
- Biomedical Research, M.S. (Non-Thesis) (<http://catalog.marshall.edu/graduate/programs-az/medicine/biomedical-research-ms-non-thesis/>)
- Biomedical Research, M.S. (Thesis) (<http://catalog.marshall.edu/graduate/programs-az/medicine/biomedical-research-ms-thesis/>)
- Biomedical Research, Ph.D. (<http://catalog.marshall.edu/graduate/programs-az/medicine/biomedical-research-phd/>)
- Clinical and Translational Science, M.S. (<http://catalog.marshall.edu/graduate/programs-az/medicine/clinical-translational-science-ms/>)
- Physician Assistant, M.M.S. (<http://catalog.marshall.edu/graduate/programs-az/medicine/physician-assistant/>)

Courses

Biomedical Research

BMR 601 Intro DNA, RNA & Proteins **3 Credit hours**

A molecular and cell biological study of the structure and function of nucleic acids and proteins.

Grade Mode: Normal Grading Mode

BMR 602 Intro Cells and Metabolism **3 Credit hours**

A molecular and cell biological study of the structure of cells and of cellular metabolism.

Grade Mode: Normal Grading Mode

BMR 603 Regulation Cell Function **2 Credit hours**

An advanced molecular and cell biological study of cell metabolism and the regulation of cell function.

Grade Mode: Normal Grading Mode

BMR 604 Cell Basis of Disease **1 Credit hour**

A molecular and cell biological study of the basis of diseases prevalent in Appalachia

Grade Mode: Normal Grading Mode

BMR 617 BMR Statistics Technique **3 Credit hours**

An application-oriented course in statistical concepts and techniques aimed at prospective researchers in the biomedical sciences.

Grade Mode: Normal Grading Mode

BMR 628 Neuroscience I **3 Credit hours**

To study and understand the structure and function of the nervous system and disorders of neuronal function.

Pre-req: BMR 600 with a minimum grade of C.

Grade Mode: Normal Grading Mode

BMR 629 Neuroscience II **3 Credit hours**

To study and understand the structure and function of the nervous system and disorders of neuronal function.

Pre-req: BMR 628.

Grade Mode: Normal Grading Mode

BMR 631 Neurosci/DevBio Lit Review **1 Credit hour**

Published articles in the neuroscience literature will be presented by all class members. Each presentation will include background introduction methods, results, and discussion of the neuroscience research.

Grade Mode: Credit/No Credit Grade Only

BMR 641 Molecular Development **3 Credit hours**

An in-depth discussion of current literature in developmental biology with emphasis on early embryo development, morphogenesis, lineage determination and regulation of developmental process.

Pre-req: BIC 628.

Grade Mode: Normal Grading Mode

BMR 644 Research Conduct **1 Credit hour**

Responsible conduct of research, including human subjects, live vertebrate animals, conflict of interest, mentor-mentee responsibilities, collaborative research, peer review, data management, research misconduct, and responsible authorship, with case discussions.

Grade Mode: Credit/No Credit Grade Only

BMR 650 Neurobiology DA I **3 Credit hours**

This graduate level course is designed to give senior undergraduates and graduate students an introduction to the pharmacological, cellular, and molecular components of drug addiction. Topics that will be discussed include: dependence on, tolerance to, and relapse for a range of drugs including opiates, psychostimulants, alcohol, cannabinoids, and nicotine.

Pre-req: BMR 628 (may be taken concurrently) with a minimum grade of C.

Concurrent PR: BMR 628

Grade Mode: Normal Grading Mode

BMR 651 Cancer Biology **4 Credit hours**

An advanced graduate course on the core principles of initiation, progression, treatment and prevention of cancer, based on current literature. (PR: BMR 601, 602, 603, 604, and permission of instructor).

Pre-req: BMR 601 and BMR 602 and BMR 603 and BMR 604.

Grade Mode: Normal Grading Mode

BMR 652 Cancer Biol Colloquium **1 Credit hour**

This is a mentored journal club for graduate students covering selected areas of current interest in cancer biology research.

Grade Mode: Credit/No Credit Grade Only

BMR 660 Communication Bio Sci I **1 Credit hour**

Biomedical graduate students are trained to plan, prepare and deliver effective scientific presentations.

Grade Mode: Credit/No Credit Grade Only

BMR 661 Communication Bio Sci II **1 Credit hour**

Biomedical graduate students are trained to plan, prepare and deliver effective scientific presentations.

Grade Mode: Credit/No Credit Grade Only

BMR 664 ORDRC Colloquium **1 Credit hour**

A seminar course where published articles in the field of obesity and obesity-related diseases are presented and discussed.

Grade Mode: Credit/No Credit Grade Only

BMR 665 CDRC Colloquium 1 Credit hour

A seminar-style series that will focus on recent advances in topics related to cardiovascular disease.

Grade Mode: Credit/No Credit Grade Only

BMR 674 Teaching Practicum 1 Credit hour

Students gain experience in teaching using a variety of methods in a supervised setting.

Grade Mode: Credit/No Credit Grade Only

BMR 676 CBR Journal Club 1 Credit hour

Mentored journal club preparation with monthly presentation in cellular and molecular biology research.

Grade Mode: Normal Grading Mode

BMR 679 Special Problems 1 Credit hour

Intensive study of a selected topic or problem. Emphasizes independent study.

Grade Mode: Credit/No Credit Grade Only

BMR 680 Seminar 1 Credit hour

Study and discussion of current topics related to the Biomedical Sciences.

Grade Mode: Credit/No Credit Grade Only

BMR 681 Thesis 1-6 Credit hours

Grade Mode: Credit/No Credit Grade Only

BMR 785 Intro to Research 1-6 Credit hours

Directed research activities requiring a completed prospectus for an advanced research project, a written report, or a research thesis. A minimum of three (3) hours required for all M.S. candidates.

Grade Mode: Credit/No Credit Grade Only

BMR 882 Research 1-15 Credit hours

Grade Mode: Credit/No Credit Grade Only

Clinical Translational Science**CTS 600 Epi Used in Med Research 3 Credit hours**

Practical application of epidemiology and biostatistics used in medical research. The course will primarily focus on the design and analysis of translational studies.

Grade Mode: Normal Grading Mode

CTS 604 Diet Gut Health 1 Credit hour

Class will examine the role of gut microbiota and diet in maintaining human health.

Grade Mode: Normal Grading Mode

CTS 610 Study Design & Stats 3 Credit hours

Students will participate in an internship with faculty in providing consultation services in study design and statistics for medical research projects.

Grade Mode: Normal Grading Mode

CTS 611 Machine Learn Journal Club 1 Credit hour

Articles that describe either clinical or translational research along with machine learning techniques will be discussed. Students are expected to read, describe and present at these fourteen, 1 hour weekly sessions.

Grade Mode: Credit/No Credit Grade Only

CTS 612 Intro Clin Machine Learn 3 Credit hours

This course is designed for those who are interested in using machine learning with a focus on translational medical research, which is concerned with bringing bioscience research discoveries into patient care. This course explores the characteristic of its methods, its benefits and limitations. Explain and describe different learning algorithm machine learning journal club is optional.

Grade Mode: Normal Grading Mode

CTS 614 Intro to Clinical Informatics 3 Credit hours

This course will introduce Redcap, explore relational DB terms, I2B2, a research data warehouse counting tool, and data manipulation using MS SQL queries, functions, procedures along with C# using LINQ.

Grade Mode: Normal Grading Mode

CTS 615 Intro Clinical Databases 3 Credit hours

This course is an introduction to the concepts of database processing and management especially as it relates to clinical translational research. The focus is to bring bioscience research discoveries into patient care. Primary topics include discussions of major database types, history of databases and database issues, security, database principles, DBMS, RDBMS, SQL queries, Big Data, Marshall Clinical Data Warehouse.

Grade Mode: Normal Grading Mode

CTS 616 Intro Clinical Program C# 3 Credit hours

Course will present C#, a tool that can be used to manipulate data within the Clinical database using LINQ/other to connect the application to the database. The focus is on translational research, which is concerned with bringing bioscience research discoveries into patient care. This course is designed for those who are interested in medical research programming using console/web/smart-phone application technology.

Grade Mode: Normal Grading Mode

CTS 620 Basic Research Operations 3 Credit hours

This course will focus on the operation of clinical research trials, providing an overview of the critical aspects involved in all stages of clinical trials.

Grade Mode: Normal Grading Mode

CTS 625 Clinical Operations Lab 1-6 Credit hours

This course is a hands on experience in Clinical Research trial operation. The course provides an opportunity for students to work with clinical research professionals on FDA-directed clinical trials.

Pre-req: CTS 620.

Grade Mode: Credit/No Credit Grade Only

CTS 628 Intro to Java Cln Prog 4 Credit hours

The goal of this course is to expose clinical informatics students to programming in Java for common problem solving tasks. This course will focus on topics related to object-oriented programming with emphasis on object oriented design and style, classes, recursion, searching and sorting, simple data structures, and graphical user interfaces.

Grade Mode: Normal Grading Mode

CTS 630 Fundamentals of Team Science 2 Credit hours

This course offers practical guidance about how best to engage in team science to pursue complex science questions and work effectively with team members.

Grade Mode: Normal Grading Mode

CTS 632 Qualitative Research	1 Credit hour	MCB 631 Medical Microbiology I	3 Credit hours
This course is designed as an introduction to qualitative research methods. It offers various approaches to designing and conducting qualitative research projects in health and health services research. Students will gain hands-on experience in various qualitative methods and analysis techniques while carrying out a research project related to their area of interest.		This course will present the major aspects of the field of medical microbiology with emphasis on selected pathogenic organisms.	
Grade Mode: Credit/No Credit Grade Only		Pre-req: BMS 600.	
CTS 635 Writing and Peer Review	1 Credit hour	Grade Mode: Normal Grading Mode	
This course teaches students to become more effective writers of scientific publications.		MCB 632 Medical Microbiology II	2 Credit hours
Grade Mode: Credit/No Credit Grade Only		This course will present a continuation of the major aspects of the field of medical microbiology with emphasis on the major pathogenic organisms.	
CTS 637 Introduction to Tableau	3 Credit hours	Pre-req: BMS 600 and MCB 631.	
Tableau is a business/clinical intelligence tool that makes it easier to process an ever-increasing stream of clinical information through data visualization, data discovery, visual analytics, dashboards, and visual storytelling. In this course, students will learn the fundamentals of creating interactive visual displays using an industry standard visualization tool using real medical data.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MCB 642 Graduate Microbiology I	4 Credit hours
CTS 640 Clinical Trials Journal Club	1 Credit hour	An advanced treatment of microbiology with emphasis on the molecular aspects of anatomy, taxonomy, and physiology and genetics of microorganisms.	
This course will be presentations and discussions of the recent literature in the area of clinical trials. Fundamental principles and new discoveries will be emphasized.		Grade Mode: Normal Grading Mode	
Grade Mode: Credit/No Credit Grade Only		MCB 643 Principles of Immunology	3 Credit hours
CTS 645 Navigating Health IT	3 Credit hours	Basic principles of the immune response system of humans and related mammals. Concepts of B & T cell function and interrelationships emphasized.	
The quality of healthcare data is critical to clinical & translational research and medical practice. Getting the right data is difficult without a basic understanding of health information systems (HIS) and medical classification standards. This course provides an overview of these HIS and standards in the healthcare industry and enables gathering and use of HIS data effectively.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MCB 648 Molec Aspects of Pathogenesis	3 Credit hours
CTS 650 Rural Clinical Experience	5 Credit hours	An in depth study of molecular mechanisms of bacterial, viral, and immune-mediated disease processes.	
This course will acquaint students with the issues of rural community health and wellness, which will allow them to participate in clinical studies in a rural environment.		Grade Mode: Normal Grading Mode	
Pre-req: CTS 620.		MCB 660 Diagnostic Virology	3 Credit hours
Grade Mode: Credit/No Credit Grade Only		A comprehensive survey of methodologies used to detect and characterize viral specific antibodies and antigens and the status of cellular immunity in virus infected hosts.	
CTS 660 Appalachian Phenotype	3 Credit hours	Pre-req: MCB 620.	
The course will describe the clinical presentations, epidemiology and molecular phenotype of disorders common in the Appalachian region.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MCB 675 Special Topics	1-4 Credit hours
Microbiology		Grade Mode: Normal Grading Mode	
MCB 620 Prin Medical Microbiology	6 Credit hours	MCB 676 Special Topics	1-4 Credit hours
The study of microorganisms, immunobiology, immunologic diseases, host resistance and the means by which diseases are produced and prevented.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MCB 677 Special Topics	1-4 Credit hours
MCB 622 Curr Topics Molec Biology	1 Credit hour	Grade Mode: Normal Grading Mode	
Critical discussion of current literature/concepts. Participants present published research papers on topics with a molecular biology component. Presentations are followed by discussion/evaluation of the contribution of the research.		MCB 679 Special Problems	1-3 Credit hours
Grade Mode: Credit/No Credit Grade Only		Grade Mode: Normal Grading Mode	
MCB 631 Medical Microbiology I	3 Credit hours	MCB 720 Microbiology	6 Credit hours
This course will present the major aspects of the field of medical microbiology with emphasis on selected pathogenic organisms.		Grade Mode: Normal Grading Mode	
Pre-req: BMS 600.		MCB 743 Principles of Immunology	3 Credit hours
Grade Mode: Normal Grading Mode		Basic principles of the immune response system of humans and related mammalian representatives. The concepts of B and T cell function and their interrelationships will be emphasized.	
MCB 632 Medical Microbiology II	2 Credit hours	Grade Mode: Normal Grading Mode	
This course will present a continuation of the major aspects of the field of medical microbiology with emphasis on the major pathogenic organisms.		MCB 780 Elective Special Projects	1 Credit hour
Pre-req: BMS 600 and MCB 631.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MCB 785 Independent Study	1-15 Credit hours
MCB 642 Graduate Microbiology I	4 Credit hours	Independent Study in Microbiology is designed to allow the student the opportunity to work with a faculty member on a topic of special interest.	
An advanced treatment of microbiology with emphasis on the molecular aspects of anatomy, taxonomy, and physiology and genetics of microorganisms.		Grade Mode: Credit/No Credit Grade Only	
Grade Mode: Normal Grading Mode		MCB 813 Research in Microbiology	1-18 Credit hours
MCB 643 Principles of Immunology	3 Credit hours	Attributes: Thesis	
Basic principles of the immune response system of humans and related mammals. Concepts of B & T cell function and interrelationships emphasized.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode			
MCB 648 Molec Aspects of Pathogenesis	3 Credit hours		
An in depth study of molecular mechanisms of bacterial, viral, and immune-mediated disease processes.			
Grade Mode: Normal Grading Mode			
MCB 660 Diagnostic Virology	3 Credit hours		
A comprehensive survey of methodologies used to detect and characterize viral specific antibodies and antigens and the status of cellular immunity in virus infected hosts.			
Pre-req: MCB 620.			
Grade Mode: Normal Grading Mode			
MCB 675 Special Topics	1-4 Credit hours		
Grade Mode: Normal Grading Mode			
MCB 676 Special Topics	1-4 Credit hours		
Grade Mode: Normal Grading Mode			
MCB 677 Special Topics	1-4 Credit hours		
Grade Mode: Normal Grading Mode			
MCB 679 Special Problems	1-3 Credit hours		
Grade Mode: Normal Grading Mode			
MCB 720 Microbiology	6 Credit hours		
Grade Mode: Normal Grading Mode			
MCB 743 Principles of Immunology	3 Credit hours		
Basic principles of the immune response system of humans and related mammalian representatives. The concepts of B and T cell function and their interrelationships will be emphasized.			
Grade Mode: Normal Grading Mode			
MCB 780 Elective Special Projects	1 Credit hour		
Grade Mode: Normal Grading Mode			
MCB 785 Independent Study	1-15 Credit hours		
Independent Study in Microbiology is designed to allow the student the opportunity to work with a faculty member on a topic of special interest.			
Grade Mode: Credit/No Credit Grade Only			
MCB 813 Research in Microbiology	1-18 Credit hours		
Attributes: Thesis			
Grade Mode: Normal Grading Mode			

MCB 814 Clin Lab Microbiol Immun
Grade Mode: Normal Grading Mode

Pharmacology

PMC 610 Intro Pharmacology
Grade Mode: Normal Grading Mode

PMC 615 Pharmacology Reviews
Grade Mode: Normal Grading Mode

PMC 620 Medical Pharmacology
 An introduction to the basic concepts of drug actions and therapeutic principles governing drug therapy. Emphasis is placed on general mechanisms, therapeutic uses and toxicity of prototypic drugs.
Pre-req: BIC 620.
Grade Mode: Normal Grading Mode

PMC 621 Medical Pharmacology I
 This course will encompass the core pharmacology concepts as well as drugs used in the treatment of infectious diseases, cancer, hematological matters, nervous system agents and cardiovascular drugs.
Pre-req: BMS 600.
Grade Mode: Normal Grading Mode

PMC 622 Medical Pharmacology II
 This course will encompass the core pharmacology concepts as well as drugs used in the treatment of pulmonary, gastrointestinal, endocrine, renal, and musculoskeletal diseases, drugs specific for mens and womens health, dermatological agents, and toxicology.
Pre-req: BMS 600.
Grade Mode: Normal Grading Mode

PMC 625 Drug Metabolism
 Topics will include a discussion of the metabolizing enzymes, enzyme induction and inhibition, toxic metabolites, prodrugs, metabolic disorders and analytical methods for studying drug metabolism.
Grade Mode: Normal Grading Mode

PMC 630 Chem Aspects Pharmacology
 An introduction to the chemical principles of pharmacology. The chemical classification, acid-base chemistry and stereochemical properties of drugs and the reactivity of drugs with biological systems will be discussed.
Grade Mode: Normal Grading Mode

PMC 633 Vistas in Pharmacology
Pre-req: PMC 620.
Grade Mode: Normal Grading Mode

PMC 635 Neuropharmacology
 A study of the actions of drugs on the nervous system.
Pre-req: BMS 600.
Grade Mode: Normal Grading Mode

PMC 639 Neuropharm Res Tech
 Class participants will be exposed to state-of-the-art neuropharmacology research techniques while in the laboratories of neuropharmacology faculty.
Grade Mode: Credit/No Credit Grade Only

PMC 640 Behavioral Pharmacology
 Behavioral methods for assaying drug action.
Pre-req: PMC 635.
Grade Mode: Normal Grading Mode

1-18 Credit hours **PMC 643 Intro Cardiopulmonary Pharm** **3 Credit hours**

A general overview of the principles of pharmacology and the mechanisms and effects of cardiovascular and respiratory drugs.
Grade Mode: Normal Grading Mode

3 Credit hours **PMC 645 Adv Cardiopulmonary Pharm** **3 Credit hours**

An indepth presentation of pharmacological aspects of cardiovascular and pulmonary systems. Current knowledge, principles and methods used in cardiopulmonary research will be discussed.

Pre-req: PMC 620 or PMC 643.
Grade Mode: Normal Grading Mode

PMC 650 General Toxicology **3 Credit hours**

Pre-req: PMC 620.
Grade Mode: Normal Grading Mode

PMC 655 Toxicology Reviews **1 Credit hour**

This course will provide a presentation and discussion of current literature in the area of toxicology. Fundamental principles and new discoveries will be emphasized.

Grade Mode: Normal Grading Mode

PMC 675 Special Topics **1-4 Credit hours**

Present course material on special areas of research or topics which are not routinely covered in existing courses.

Grade Mode: Normal Grading Mode

PMC 676 Special Topics **1-4 Credit hours**

Grade Mode: Normal Grading Mode

PMC 677 Special Topics **1-4 Credit hours**

Grade Mode: Normal Grading Mode

PMC 720 Medical Pharmacology **8 Credit hours**

Grade Mode: Normal Grading Mode

PMC 780 Elective Special Projects **1 Credit hour**

Grade Mode: Normal Grading Mode

PMC 785 Clinical Pharmacology **1-18 Credit hours**

Independent Study of Pharmacology
Grade Mode: Pass/Fail Grading Mode

PMC 868 PMC Externship **1-18 Credit hours**

Out-of-State Externship
Grade Mode: Pass/Fail Grading Mode

Physician Assistant

PAS 500 Foundations of Medicine **7 Credit hours**

This course develops an understanding of normal physiology, genetics, microbiology, pathology and pathophysiologic concepts of disease per organ system. Knowledge will be applied in subsequent semesters.

Co-req: PAS 520, PAS 530, PAS 550
Grade Mode: Normal Grading Mode

PAS 520 Gross Anatomy for the PA **4 Credit hours**

This course encompasses a comprehensive approach to the study of gross anatomy while incorporating appropriate clinical application to basic organization, structure, sectional, and surface anatomy.

Co-req: PAS 500, PAS 530, PAS 550
Grade Mode: Normal Grading Mode

PAS 530 Pharmacology Principles **3 Credit hours**

This course, the first in a series, develops skills related to applying general principles of pharmacology and pharmacotherapeutics to the treatment and management of disease.

Co-req: PAS 500, PAS 520, PAS 550
Grade Mode: Normal Grading Mode

<p>PAS 550 History and Physical Exam 3 Credit hours This course focuses on the medical record and the skills needed to obtain a medical history and perform a complete physical examination. Students will apply knowledge through experiential components. Co-req: PAS 500, PAS 520, PAS 530 Grade Mode: Normal Grading Mode</p>	<p>PAS 612 Clinical Concepts II 2 Credit hours Aligning with the topics in Clinical Medicine II, this course deepens knowledge by developing clinical decision making and problem solving skills in a case based format. Co-req: PAS 610, PAS 611, PAS 613, PAS 614, PAS 615, PAS 616 Grade Mode: Normal Grading Mode</p>
<p>PAS 600 Clinical Medicine I 6 Credit hours This course, the first in a series, provides intensive study of human diseases and disorders in the selected areas of clinical medicine. Co-req: PAS 601, PAS 602, PAS 603, PAS 604, PAS 605, PAS 606 Grade Mode: Normal Grading Mode</p>	<p>PAS 613 Clinical Assessment II 2 Credit hours Building on History and Physical Examination and aligning with the topics in Clinical Medicine II, this course applies physical assessment skills to the organ systems being concurrently studied. Co-req: PAS 610, PAS 611, PAS 612, PAS 614, PAS 615, PAS 616 Grade Mode: Normal Grading Mode</p>
<p>PAS 601 Pharmacology for the PA I 2 Credit hours Aligning with the topics in Clinical Medicine I, this course applies pharmacologic and pharmacotherapeutic principles to the treatments of diseases and disorders studied. Co-req: PAS 600, PAS 602, PAS 603, PAS 604, PAS 605, PAS 606 Grade Mode: Normal Grading Mode</p>	<p>PAS 614 Testing and Procedures II 2 Credit hours This course develops diagnostic and therapeutic skills along with essential technical skills and procedures necessary for clinical practice. Co-req: PAS 610, PAS 611, PAS 612, PAS 613, PAS 615, PAS 616 Grade Mode: Normal Grading Mode</p>
<p>PAS 602 Clinical Concepts I 2 Credit hours Aligning with the topics in Clinical Medicine I, the course deepens knowledge by developing clinical decision making and problem-solving skills in a case-based format. Co-req: PAS 600, PAS 601, PAS 603, PAS 604, PAS 605, PAS 606 Grade Mode: Normal Grading Mode</p>	<p>PAS 615 Health Policy for the PA 2 Credit hours This course explores issues of cultural competence, ethics, patient safety, and the political and public health issues that affect patient care for the practicing PA. Co-req: PAS 610, PAS 611, PAS 612, PAS 613, PAS 614, PAS 616 Grade Mode: Normal Grading Mode</p>
<p>PAS 603 Clinical Assessment I 2 Credit hours Building upon History and Physical Examination and aligning with topics in Clinical Medicine I, this course applies physical assessment skills to the organ systems being concurrently studied. Co-req: PAS 600, PAS 601, PAS 602, PAS 604, PAS 605, PAS 606 Grade Mode: Normal Grading Mode</p>	<p>PAS 616 Clinical Specialties I 3 Credit hours This course provides an intensive study in the evaluation, diagnosis and treatment of patients in the specialty areas of pediatrics, reproductive medicine and geriatrics. Co-req: PAS 610, PAS 611, PAS 612, PAS 613, PAS 614, PAS 615 Grade Mode: Normal Grading Mode</p>
<p>PAS 604 Testing and Procedures I 2 Credit hours This course develops diagnostic and therapeutic skills along with essential technical skills and procedures necessary for clinical practice. Co-req: PAS 600, PAS 601, PAS 602, PAS 603, PAS 605, PAS 606 Grade Mode: Normal Grading Mode</p>	<p>PAS 620 Clinical Medicine III 6 Credit hours This course, the third in a series, provides intensive study of human diseases and disorders in selected areas of clinical medicine. Co-req: PAS 621, PAS 622, PAS 623, PAS 624, PAS 625, PAS 626, PAS 627 Grade Mode: Normal Grading Mode</p>
<p>PAS 605 PA's in Health Care 2 Credit hours This course provides students with the knowledge and understanding of the history of the Physician Assistant Profession and the development and status of the profession within the US health system. Co-req: PAS 600, PAS 601, PAS 602, PAS 603, PAS 604, PAS 606 Grade Mode: Normal Grading Mode</p>	<p>PAS 621 Pharmacology for the PA III 2 Credit hours Aligning with the topics in Clinical Medicine III, this course applies pharmacologic and pharmacotherapeutic principles to the treatments of diseases and disorders studied. Co-req: PAS 620, PAS 622, PAS 623, PAS 624, PAS 625, PAS 626, PAS 627 Grade Mode: Normal Grading Mode</p>
<p>PAS 606 PA Evidence Based Practice 2 Credit hours This course prepares students to search, interpret, and evaluate the medical literature. Emphasis is placed on life-long learning and the importance of applying gained knowledge to patient care. Co-req: PAS 600, PAS 601, PAS 602, PAS 603, PAS 604, PAS 605 Grade Mode: Normal Grading Mode</p>	<p>PAS 622 Clinical Concepts III 2 Credit hours Aligning with the topics in Clinical Medicine III, this course deepens knowledge by developing clinical decision making and problem-solving skills in a case-based format. Co-req: PAS 620, PAS 621, PAS 623, PAS 624, PAS 625, PAS 626, PAS 627 Grade Mode: Normal Grading Mode</p>
<p>PAS 610 Clinical Medicine II 6 Credit hours This course, the second in a series, provides intensive study of human diseases and disorders in the selected area of clinical medicine. Co-req: PAS 611, PAS 612, PAS 613, PAS 614, PAS 615, PAS 616 Grade Mode: Normal Grading Mode</p>	<p>PAS 623 Clinical Assessment III 2 Credit hours Building upon History and Physical Examination and aligning with the topics in Clinical Medicine III, this course applies physical assessment skills to the organ systems being concurrently studied. Co-req: PAS 620, PAS 621, PAS 622, PAS 624, PAS 625, PAS 626, PAS 627 Grade Mode: Normal Grading Mode</p>
<p>PAS 611 Pharmacology for the PA II 2 Credit hours Aligning with the topics in Clinical Medicine II, this course applies pharmacologic and pharmacotherapeutic principles to the treatments of diseases and disorders studied. Co-req: PAS 610, PAS 612, PAS 613, PAS 614, PAS 615, PAS 616 Grade Mode: Normal Grading Mode</p>	<p>PAS 624 Testing and Procedures III 2 Credit hours This course develops diagnostic and therapeutic skills along with essential technical skills and procedures necessary for clinical practice. Co-req: PAS 620, PAS 621, PAS 622, PAS 623, PAS 625, PAS 626, PAS 627 Grade Mode: Normal Grading Mode</p>

PAS 625 PA Professional Practice	2 Credit hours	PAS 659 Orthopaedics	4 Credit hours
This course focuses on the economics of healthcare, risk reduction, billing and coding, preparing for clinical practice, and interprofessional collaboration.		This rotation provides clinical instruction in orthopaedics in outpatient and inpatient settings.	
Co-req: PAS 620, PAS 621, PAS 622, PAS 623, PAS 624, PAS 626, PAS 627		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		PAS 660 PA Clinical Elective	4 Credit hours
PAS 626 Clinical Specialties II	3 Credit hours	This rotation provides clinical instruction in the area of medicine related to the student's clinical or academic interest. Faculty approval is required.	
This course provides an intensive study in the evaluation, diagnosis and treatment of patients in the areas of surgery, emergency medicine, and rehabilitative medicine.		Grade Mode: Normal Grading Mode	
Co-req: PAS 620, PAS 621, PAS 622, PAS 623, PAS 624, PAS 625, PAS 627		PAS 690 Senior Seminar	3 Credit hours
Grade Mode: Normal Grading Mode		This course applies medical knowledge, interpersonal skills, patient care skills and professionalism learned in preparation for a student to enter clinical practice.	
PAS 627 Psychiatry for the PA	2 Credit hours	Grade Mode: Normal Grading Mode	
This course provides a basic knowledge of psychiatry, psychiatric medical conditions, and special approaches to care for patients with a variety of mental health conditions.		Physiology	
Co-req: PAS 620, PAS 621, PAS 622, PAS 623, PAS 624, PAS 625, PAS 626		PHS 626 Neurophysiology I	1 Credit hour
Grade Mode: Normal Grading Mode		To study and understand the basic functional principles of the cells of the nervous system, and organization of cells into functional systems.	
PAS 650 PA Primary Care I	4 Credit hours	Pre-req: BMS 600.	
This rotation provides clinical instruction in primary care in an outpatient medical setting.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		PHS 627 Neurophysiology II	1 Credit hour
PAS 651 PA Primary Care II	4 Credit hours	To study and understand the major functional systems of the brain.	
This rotation provides clinical instruction in primary care in a rural, outpatient setting.		Pre-req: PHS 626.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
PAS 652 PA Psychiatry I	4 Credit hours	PHS 628 Mammalian Neurophysiology	2 Credit hours
This rotation provides clinical instruction in the care with patients with psychiatric illness and behavioral health disorders. Differing aspects of psychiatric care and medication management are introduced.		This course is a basic introductory, survey course covering neurophysiology from sub-cellular level to behavioral level.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
PAS 653 PA Internal Medicine I	4 Credit hours	PHS 629 Mammalian Physiology	6 Credit hours
This rotation provides clinical instruction in internal medicine in an inpatient setting. The student will develop an awareness of the complexity of disease processes and different diagnosis.		A study of mammalian systems including pulmonary, renal, cardiovascular, gastrointestinal, endocrinological and nervous systems. Emphasis will be placed on homeostatic mechanisms and on experimental approaches to physiology.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
PAS 654 PA Internal Medicine Sub	4 Credit hours	PHS 630 Experimental Physiology	1 Credit hour
This rotation provides clinical instruction in an internal medicine sub-specialty.		A laboratory course in mammalian physiology which includes instruction in surgical preparation, bioinstrumentation technique and open-chest surgery in dogs.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
PAS 655 PA Women's Health	4 Credit hours	PHS 631 Physiology Practicum	2 Credit hours
This rotation provides clinical instruction in obstetrics and gynecology in both outpatient and inpatient settings.		Experience in laboratory instruction of medical and graduate students in the mammalian physiology laboratory.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
PAS 656 PA Pediatrics	4 Credit hours	PHS 632 Physiology of Sleep	1 Credit hour
This rotation provides clinical instruction in pediatric primary care.		Detailed examination of changes in EEG, EMG, cardiorespiratory function and ocular motility during sleep.	
Grade Mode: Normal Grading Mode		Pre-req: PHS 629.	
PAS 657 PA General Surgery	4 Credit hours	Grade Mode: Normal Grading Mode	
This rotation provides clinical instruction in the principles of surgery, pre-operative evaluation and preparatory procedures, post-operative care, and development of surgical skills.		PHS 634 Advanced Neurophysiology	1-2 Credit hours
Grade Mode: Normal Grading Mode		Bioelectric potentials. A.C. and D.C. potentials, transcortical potentials, E.E.G., corneo-retinal potential, blood/CSF potential, etc.	
PAS 658 PA Emergency Medicine	4 Credit hours	Pre-req: PHS 629.	
This rotation provides clinical instruction in emergency medicine.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		PAS 638 Adv Cardiovascular Phys	1-2 Credit hours
		Pre-req: PHS 629.	
		Grade Mode: Normal Grading Mode	

PHS 639 Neurophys Res Tech 3 Credit hours

Class participants will be exposed to state-of-the-art neurophysiology research techniques while in the laboratories of neurophysiology faculty.

Grade Mode: Credit/No Credit Grade Only

PHS 661 Endocrinology 3 Credit hours

An in depth study of the endocrine system with special emphasis on the role of experimentation in the development of concepts in endocrine physiology (PR: BMS 600 or Equivalent; Permission)

Pre-req: BMS 600.

Grade Mode: Normal Grading Mode

PHS 666 Physiology of the Cell 3 Credit hours

An in-depth study of selected specific topics in cell physiology.

Pre-req: BMS 600.

Grade Mode: Normal Grading Mode

PHS 667 Experimental Appr to Phys 4 Credit hours

This course introduces students to the fundamental principles and research underlying the normal functioning of the cardiovascular, respiratory, renal, endocrine, reproductive, nervous, and gastrointestinal systems.

Grade Mode: Normal Grading Mode

PHS 675 Special Topics 1-4 Credit hours

Present course material on special areas of research or topics which are not routinely covered in existing courses.

Grade Mode: Normal Grading Mode

PHS 676 Special Topics 1-4 Credit hours

Present course material on special areas of research or topics which are not routinely covered in existing courses.

Grade Mode: Normal Grading Mode

PHS 677 Special Topics 1-4 Credit hours

Present course material on special areas of research or topics which are not routinely covered in existing courses.

Grade Mode: Normal Grading Mode

PHS 701 Physiology 8 Credit hours

Grade Mode: Normal Grading Mode

PHS 780 Elective Special Projects 1 Credit hour

Grade Mode: Normal Grading Mode

PHS 785 Independent Study 1-15 Credit hours

Independent Study in Physiology is designed to allow the student the opportunity to work with a faculty member on a topic of special interest.

Grade Mode: Credit/No Credit Grade Only

PHS 820 Medical Physiology 1-18 Credit hours

Grade Mode: Normal Grading Mode