PHARMACY (PMD)

PMD-601 Biochemical Principles I (3 credits)
Students learn about the structure/function relationships among the components responsible for the biochemical functions of life. The first semester topics include proteins, enzymes, carbohydrates, bioenergetics, metabolism (catabolism and anabolism) lipids, membranes, nucleic acids, biotechnology, biochemical methods, vitamins and nutrition.

PMD-603 Anatomy Physiology Pathophysiology I (4 credits)
This is the first of two courses in which students learn about the structural and functional relationships of the human organism, emphasizing cells and tissues, the integumentary, skeletal, muscular, nervous systems, and sense organs. Students build a comprehensive theoretical foundation of the phenomena that produce alterations in human physiologic function throughout life, emphasizing disease processes as disturbances of the body's homeostasis. The body's defense mechanisms and their breakdown, and clinical assessment methods are also presented in the course. Students view classroom demonstrations that examine the skeletal, muscular, and nervous system, and their composite cell and tissue types.

PMD-604 Anatomy Physiology Pathophysiology II (4 credits)
Comprehensive Anatomy, Physiology and Pathophysiology II + laboratory provides a sequel to PMD-603 and PMD-613; the course continues examination of organ systems. Material includes anatomical description, physiological explanations, and pathological states, considered as disruptions of the normal anatomy and physiology. Etiology, pathogenesis, and treatment approaches will be discussed. This course will undertake coverage of: cell physiology and response to injury, inflammation, fever, healing, cell cycle and neoplasia, musculoskeletal and joint disorders, neurophysiology, neurological & psychological disorders, pathophysiology of selected endocrine glands, physiology and disorders of the digestive system and selected auxiliary glands (liver and pancreas).

PMD-605 Principles of Drug Action I (4 credits)
This course introduces drugs as molecules, including the basic principles related to molecules such as equilibrium and kinetic phenomena. Initial information provided in the course also includes the molecular basis of drug selectivity and drug action. The latter portion of the course then focuses on the primary determinants of the disposition of drugs in the body, namely absorption, distribution, metabolism and excretion.

PMD-606 Principles of Drug Action II (5 credits)
The initial portion provides an introduction to the role of pharmacology in pharmacy and moves on to basic receptor pharmacology and enzymology. The course then continues the molecular basis of pharmacologic activity, protein binding, complexion and drug action. Basic aspects of medicinal chemistry and drug metabolism are also covered. The latter portion of the course then delves into various dosage forms and routes of drug delivery.

PMD-607 Prof of Pharmacy & Health Care Systems (3 credits)
This course introduces students to the evolving US health care system. Students learn about the social, economic, and political environments in which health care is delivered, and the impact of these factors on the practice of pharmacy. By examining personal strengths and weaknesses, exploring career options, and thinking and writing reflectively, students will develop lifelong learning skills.

PMD-610 Hlth Comm Diversity & Bioethics Communications/Diversity/Bioethics (2 credits)
Students learn to apply the theoretical principles for communicating effectively with patients, families, and physicians, other health professionals, and provider groups. Students discuss the impact of race, sexual orientation, culture, religion, and physical ability on patients perceptions of the healthcare system and the delivery of services. Students also learn to recognize ethical dilemmas and resolve problems using basic ethical principles and an ethical decision-making process.

PMD-611 Prof Dev of Student Pharmacist I (2 credits)
This is the first in a six-term sequence of courses that augments and enhances student learning throughout the didactic curriculum. In this first course, students will be introduced to the profession of pharmacy including the evolution of practice from a dispensing to a pharmaceutical care model. Through team-based learning students will systematically analyze patient cases using scientific and clinical reasoning. They will utilize sources of professional knowledge, strategies for accessing drug information and literature, and quantitative and qualitative data to support decision making. To help students (and faculty) assess their progress in achieving curricular and professional goals, they will create a professional e-portfolio that will help them manage various types of evidence that reflect their learning and growth.

PMD-612 Prof Dev of Student Pharmacist II (1 credits)
This is the second in a six-term sequence of courses. Students participate in team-based learning to foster a deeper understanding of course material, and develop necessary skills through case discussion and other active learning methods.

PMD-613 Patient Assessment I (1 credits)
In this practicum course, students will learn and practice the fundamentals of patient assessment, including physical examination, interviewing skills (such as history taking and symptom analysis) and interpretation of laboratory test results. Students will also become familiar with common drug names, categories, dosing and therapeutic uses. Classroom time will be a combination of large and small group work. Skill-based activities, such as the practicing of components of a physical examination, will be practiced in student pairs with designated small teams.

PMD-614 Patient Assessment II (1 credits)
In this course, students will learn and practice the fundamentals of patient assessment, including physical examination, interviewing skills and interpretation of laboratory test results. Students will also become familiar with common drug names, categories, dosing and therapeutic uses, as well as counseling skills based on the top medications. Classroom time will be a combination of large and small group work. Skill-based activities, such as the practicing of the components of a physical examination, will be demonstrated in student pairs with designated small teams.
This course reviews basic math skills necessary for solving pharmaceutical calculation problems and accurate weighing and measurement of pharmaceutical ingredients. Specific calculations involved in individual dosage forms will be covered as well as the application to hospital and community pharmacy.

PMD-689 Special Topics (1-3 credits)

PMD-701 Principles of Drug Action III (2 credits)

This course reviews basic math skills necessary for solving pharmaceutical calculation problems and accurate weighing and measurement of pharmaceutical ingredients. Specific calculations involved in individual dosage forms will be covered as well as the application to hospital and community pharmacy.

PMD-626 Introductory Pharmacy Calculations (1 credits)

PMD-624 Self-Care (3 credits)

Students learn about the role of the pharmacist in the management of self-limiting illnesses and self-care. Students learn appropriate triage and referral techniques and the advantages and disadvantages of a variety of non-prescription products and devices, as well as complementary and non-pharmacologic interventions utilized for self-care problems.

PMD-702 Medical Microbiology & Immunology (3 credits)

Students learn about recent advances in pharmaceutical dosage forms (such as protein pharmaceuticals) that are utilized in current and future pharmacy practice.

PMD-703 Pharmacotherapeutics I (4 credits)

This course is the first of a seven-part series in which students will learn to integrate the principles of pathophysiology, medicinal chemistry, drug disposition and pharmacology in order to optimize therapeutic outcomes. Specific topics covered will include cardiovascular and pulmonary disorders including hypertension, heart failure, ischemic heart disease, acute coronary syndromes, arrhythmias, cardiomyopathies, thromboembolism, hyperlipidemia, stroke, shock, asthma, chronic obstructive lung disease, acute respiratory distress syndrome, and cystic fibrosis.

PMD-618 Community IPPE (2 credits)

PMD-617 Hospital IPPE (1 credits)

PMD-619 P1 IPPE Institutional (1 credits)

PMD-620 Topics in Pharmacy (0 credits)

PMD-622 Topics in Pharmacy (0 credits)

PMD-624 Self-Care (3 credits)

This course reviews basic math skills necessary for solving pharmaceutical calculation problems and accurate weighing and measurement of pharmaceutical ingredients. Specific calculations involved in individual dosage forms will be covered as well as the application to hospital and community pharmacy.

PMD-689 Special Topics (1-3 credits)

PMD-701 Principles of Drug Action III (2 credits)

This is the final course of the three-course sequence. Students continue to learn how dosage forms and routes of delivery affect the disposition of drugs. Students also learn about recent advances in pharmaceutical dosage forms (such as protein pharmaceuticals) that are utilized in current and future pharmacy practice.

PMD-702 Medical Microbiology & Immunology (3 credits)

Students learn the classification, morphology, and virulence of microorganisms and medical pathogens, the epidemiology and pathogenesis of infectious diseases, and the basic concepts of immunology. Students utilize their knowledge of immunology to understand the principles of antibiotic use, emphasizing the need to understand the site of infection, the susceptibility patterns for responsible organisms and the ability of the drug to reach the site of infection.

PMD-703 Pharmacotherapeutics I (4 credits)

This course is the first of a seven-part series in which students will learn to integrate the principles of pathophysiology, medicinal chemistry, drug disposition and pharmacology in order to optimize therapeutic outcomes. Specific topics covered will include the pharmacotherapy of: acute and chronic kidney disease, fluid and electrolyte disorders, acid-base disorders, erectile dysfunction, benign prostatic hyperplasia, and urinary incontinence.

PMD-704 Pharmacotherapeutics III (4 credits)

This course is the third of a seven-part series in which students will learn to integrate the principles of pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy in order to optimize therapeutic outcomes for patients. Specific topics covered will include the pharmacotherapy of: anesthesia; neurologic disorders such as epilepsy, movement disorders and migraine headaches; psychiatric disorders such as schizophrenia, mood disorders, anxiety disorders, sleep disorders and dementia; and diseases of the eye.
PMD-713 Pharmacogenomics (3 credits)
This course will introduce genetics and molecular and cellular biology and will describe the nature of genetic materials and the universal genetic code. Students should be able to identify and describe molecular mechanisms such as replication, transcription and translation. The goal of this course is to enable students to understand how these disciplines can be used to explain the possible genetic basis for variability in drug response. Also, there will be discussion on the application of bioinformatics studies to pharmacogenomics and ethical issues in genomics. The pharmacogenetics of oxidative drug metabolism will be presented, as well as the potential applications to tailoring drug therapy. A discussion of drug transporters pharmacogenetics will include localization and function, variability and clinical consequences. The role of genetic variability in drug targets on drug efficacy and toxicity, and application to individualize drug therapy will be explored. Finally, current and future pharmacogenomics applications for several therapeutic areas such as oncology, hematology, infectious diseases such as HIV, TB, etc. will be described.

PMD-714 Pharmacy Management (3 credits)
In this course students learn the common management principles employed in the practice of pharmacy. Students learn business methods ranging from personal management to operations management, managing people, accounting basics and finance. Students also learn about marketing, purchasing, value-added services, and obtaining reimbursement for providing cognitive services as well as managing risks. Students are expected to apply concepts learned in class to prepare a business plan that provides the blueprint for buying an existing independent community pharmacy or developing a new pharmacy.

PMD-717 P2 IPPE Community (2 credits)

PMD-718 Community IPPE (2 credits)

PMD-719 P2 IPPE Institutional (1 credits)

PMD-720 Hospital IPPE (1 credits)

PMD-721 Topics in Pharmacy Assessment (0 credits)

PMD-722 Topics in Pharmacy (0 credits)

PMD-801 U.S. and N.Y.S. Pharmacy Law (2 credits)
This course introduces students to the federal and New York state laws and regulations which govern the practice of pharmacy and regulate the manufacture and distribution of drug products and devices. Students learn the basic principles of tort law and professional malpractice. Students apply concepts learned in class to the analysis of case studies. Students review the historical events that have shaped today’s professional pharmacy practice, and learn about the drug development and distribution system from a legal perspective.

PMD-803 Infectious Disease V (4 credits)
This course is the fifth in a seven-part series in which students will learn to integrate the principles of pathophysiology, medicinal chemistry, drug disposition, and pharmacology in order to optimize therapeutic outcomes. Specific topics covered will include the pharmacotherapy of gastrointestinal, nutritional, and skin, bone and joint disorders including gastroesophageal reflux, peptic ulcer, inflammatory bowel disease, nausea, vomiting, diarrhea, constipation, irritable bowel syndrome, pancreatitis, viral hepatitis, obesity, osteoporosis, rheumatoid arthritis, osteoarthritis, gout, acne, atopic dermatitis, and psoriasis.

PMD-804 Pharmacotherapeutics VII (4 credits)
This course is the seventh of an eight-part series in which students will learn to integrate the principles of pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy in order to optimize therapeutic outcomes and tolerability for patients. This course will focus on agents used in the management of toxicological disorders, pain disorders, substance abuse, and disorders specific to pediatric and geriatric populations. This course will also include a discussion on topics related to medication safety.

PMD-805 Pharm Gastrointestinal VI I (4 credits)
This course is the sixth in a seven-part series in which students will learn to integrate the principles of pathophysiology, medicinal chemistry, drug disposition, and pharmacology in order to optimize therapeutic outcomes. Specific topics covered will include the pharmacotherapy of infectious diseases of the respiratory tract, skin, and soft tissue, tuberculosis, parasitic diseases, urinal tract infections, sexually transmitted diseases, sepsis, fungal infections, and human immunodeficiency virus infection.

PMD-808 Pharmacotherapeutics VIII (4 credits)
This course is the eighth of an eight-part series in which students will learn to integrate the principles of pathophysiology and pharmacotherapy, medicinal chemistry, and pharmacology with active learning sessions involving case discussion in order to optimize therapeutic outcomes and tolerability for patients. This course will focus on agents used in the management of: anemia, coagulation disorders, drug-induced hematologic disorders; oncologic diseases including solid tumors and hematologic malignancies such as cancers of the breast, lung, colon, rectum, prostate, ovaries, skin, and lymphoma, leukemia, and myelodysplastic syndromes. Drugs used in the supportive care of cancer patients will also be a focus including those used to manage nausea and vomiting, constipation, and tumor lysis syndrome.

PMD-810 Population Based Health Care (2 credits)
Students learn how pharmacists contribute to the delivery of effective, quality health and disease prevention services. Students learn to apply population-specific data, quality assurance strategies, and processes to assure access to rational, safe and cost-effective drug therapy. Students also learn to utilize health-related quality of life measures and decision analyses to assess the health status of individuals in the U.S. healthcare system, and make comparisons to individuals within other global systems. Utilizing the economic and epidemiologic principles learned in class, students critique peer-reviewed public health literature and develop a framework for a group research project that will be completed during the Advanced Pharmacy Practice Experience of the fourth professional year.

PMD-811 Prof Dev of Student Pharmacist V (1 credits)
This is the fifth in a six-term sequence of courses. Students participate in team-based learning to foster a deeper understanding of course material, and develop necessary skills through case discussion and other active learning methods.

PMD-812 Professional Development of a Student Pharmacist IV - Gateway to Clerkship (1 credits)
This is the final course in the six-term sequence. Students participate in team-based learning to foster a deeper understanding of course material, and develop necessary skills through case discussion and other active learning methods.
PMD-813 Evidence-Based Medicine II (2 credits)
Students demonstrate effective communication and organizational skills by preparing, delivering, and evaluating professional seminars.

PMD-814 Evidence-Based Medicine III (2 credits)
Students demonstrate effective communication and organizational skills by preparing, delivering, and evaluating professional seminars.

PMD-818 Advanced Therapeutics Elective (2 credits)
Advanced therapeutics will explore in greater detail the pharmacotherapy of complex and common disease states such as cardiovascular and diabetes care. This course will carry on the foundation created in the Pharmacotherapeutics sequence and integrate concepts across diverse patient groups and treatment goals.

PMD-819 Intro Residency Practice (2 credits)
The purpose of this course is to prepare students for applying to PGY-1 residency positions following graduation. Topics to be covered include: benefits and downfalls of completing one or more residency program(s); choosing a program (ASHP accredited vs. non-accredited and other distinguishing features); preparing for the ASHP Residency Showcase; preparing a curriculum vitae; identifying individual student strengths; preparing for on-site interviews; obtaining appropriate letters of reference; and introduction to the residency match program.

PMD-820 Intro to Residency Practice (2 credits)
The purpose of this course is to prepare students for applying to PGY-1 residency positions following graduation. Topics to be covered include: benefits and downfalls of completing one or more residency program(s); choosing a program (ASHP accredited vs. non-accredited and other distinguishing features); preparing for the ASHP Residency Showcase; preparing a curriculum vitae; identifying individual student strengths; preparing for on-site interviews; obtaining appropriate letters of reference; and introduction to the residency match program.

PMD-821 Substance Abuse (2 credits)
This course would look at the multiple dimensions of substance abuse including pharmacology, treatment, legal aspects, risks in health care workers, concurrent diagnoses (mental health).

PMD-822 Toxicology (2 credits)
This class will provide a foundation of knowledge in clinical toxicology, covering toxicology history, poisoning epidemiology, structure and function of poison centers and poison prevention, as well as the toxicity and treatment of numerous specific substances including various prescription and over the counter drugs, household poisons (toxic alcohols, carbon monoxide, caustics, etc.), substances of abuse, and environmental toxins, among others. Throughout the course there will be a focus on the mechanisms and indications for various antidotes and application to various patient cases.

PMD-823 Disease Prevention Through Lifestyle (2 credits)
This elective course aims to complement the pharmacotherapeutics sequence of courses for those students interested in learning more about the non-pharmacologic options we recommend alongside pharmacotherapy for disease prevention/management. Many foods and activities exhibit a pharmacologic effect, even though they are not considered pharmacologic agents. Through our frequent interaction with the public in pharmacy settings, pharmacists are often asked about specific foods, supplements or physical activities and how they may help is disease modification and/or weight loss. This course will provide a balanced look at the advantages and disadvantages of the various options available to patients. Note: students will be asked to experiment with temporary changes in diet and physical activity and provide reflections on these experiences.

PMD-824 Natural Product Therapeutics (2 credits)
The focus of this course is to study natural remedies and phytomedicinals, which are widely used by the general public as self-selected (OTC) products for therapeutic, quality of life, and prophylactic purposes. The course will focus on the safety, efficacy, herb-food, herb-drug, and herb-herb interactions. The role of pharmacists to assist consumers to select the safest, most proper and useful natural remedies will be considered.

PMD-825 Emergency Response (2 credits)
This course will cover topics such as a review of basic first aid, ACLS/PALS topics, pharmacology of emergency meds, interviewing techniques for triage of patients, basic skills (BP, CPR, c-spine stabilization, HR, RR, AED), emergency preparedness topics and possible public health issues. Through this course students will begin to understand emergency medicine algorithms, patient assessment skills/triage in various scenarios, and basic life-saving skills and procedures.

PMD-826 Geriatric Pharmacotherapy (2 credits)
The aging of the US population will have a major effect on the future practice of pharmacy. By 2030, an estimated 71 million adults, or approximately 1 in 5 Americans, will be 65 years of age or older. With an estimated 34% of all prescription medications used by older adults, most pharmacists will be expected to care for an older adult at some point in their career. This elective will expand upon the fundamental geriatric concepts presented throughout the curriculum as well as introduce consultant pharmacy, the practice within the profession of pharmacy that has its roots in the provision of pharmacy services to nursing facilities (NFs)–and other long-term care (LTC) environments. Instruction will include guest lectures, formative quizzes, summative exams, case analyses, and a team assignment.

PMD-827 Independent Clinical Research (2 credits)
This is part 1 of a 3 part elective series to provide a structured environment to allow students to complete a clinical research project with the supervision of a faculty member. Each part of the elective will have different objectives to keep the student on track with the ultimate goal of submitting an abstract or writing a paper by the end of the 3 part elective. A topic can be self-chosen or assigned. The focus of the Fall elective will entail conducting a literature review and creating a research proposal that will be submitted to the applicable institutional review board (IRB). It is not required for students to take the Spring elective or APPE elective if they do not wish to complete the research project after the Fall elective. However, this is a sequential series so a student must start with the Fall semester elective.
PMD-829  Spanish Pharmacy Practitioners  (2 credits)
This course is a basic course in Spanish geared to dispensing pharmacy. It will include basic anatomy and disease state terminology, medication counseling, directions for medication use, and patient history terms.

PMD-830  Nuclear Pharmacy  (3 credits)
This elective introduces students to the principles and practice of nuclear medicine and the role of the nuclear pharmacist. The student will understand the basic concepts of nuclear pharmacy and the quality control involved in producing a radiopharmaceutical. The elective will review many clinical images of radiopharmaceutical uptake in organ systems thus diagnosing disease states in patients. The course concludes by spending 1 week at a nuclear pharmacy observing the practices and procedures reviewed during the semester.

PMD-831  Ethics in Pharmacy Practice  (2 credits)
This elective course prepares students to approach ethical dilemmas objectively with a thorough understanding of professional ethical responsibility. This course assists students to: distinguish ethical from other kinds of issues in professional practice; identify the ethically relevant features of a case; identify the ethical options open to a pharmacist faced with an ethical problem; provide justification for the best options; consider counter-arguments for one's position; practice the act of responding personally to an ethical problem in clinical practice through 1:1 interaction; and enhance commitment to promoting the dignity of others. Practicing pharmacists are called upon to resolve ethical conflicts; this is unavoidable. Whether dramatic or relatively trivial, the choices made are important. Also, as practice evolves toward increasing application of the principles and methods of pharmaceutical care acumen and skill in management of ethical issues is crucial.

PMD-832  Basic Pharmaceutical Research II  (3 credits)
PMD-833  Integrated Compound & Practice  (2 credits)
Students will be assigned to assist faculty in the laboratory component of the integrated compounding and practice course (PMD 709). Students enrolled in this course are also expected to maintain confidentiality of grades, evaluations, and other course materials. At the end of the semester, the students’ performance will be evaluated by the course coordinator. The time commitment would include the 3 hr. lab session, along with a separate recitation time to go over grading of previous work and prepare for the upcoming lab week.

PMD-834  Independent Clinical Research  (2 credits)
PMD-836  Academic Practice in Patient Care Skills  (2 credits)
The goal of this course is to give the students in-depth understanding of the science and forces behind the discovery of novel drugs and treatment approaches. The lectures will cover all stages of the discovery and development process starting with the basic science, through the specific design of clinical trials and potential clinical applications. The lectures will be based on the analysis of primary literature in a case study format. Major breakthroughs and standard-of-care changing paradigms will be comprehensively discussed and analyzed. Student attendance and participation is a critical part of this course. Articles to be discussed during the class will be sent to the students prior to the class meeting session by a week.

PMD-837  Research Elective  (3 credits)
This elective will introduce the student to the field of pharmaceutical research, both academic and industrial. It will begin with a series of up to four lectures, two covering the drug discovery and development process and up to two lectures given by basic research faculty who will discuss their own research interests. The remainder of the elective will be taught in the laboratory where the student will be exposed to research techniques that match their interests (e.g., chemistry, pharmacology and pharmaceutics or molecular biology). This is a required 2 part/2 semester course offering.

PMD-838  Preparing for Management of Pharmacy Practice  (2 credits)
This course is a core elective and is designed to expose the student to the core key principles of managing practice for the staff pharmacist interested in preparing for a career in pharmacy management. This course will focus on issues ranging from staffing, purchasing contracts and inventory to HR factors (dealing with difficult employees, establishing and cultivating core competency in staff, emotional intelligence for managers, and unions in healthcare) and meeting and preparing for the necessary accreditation standards for a site survey by Joint Commission, ASHP residency training and CMS. This course may include guest speakers from these organizations.

PMD-839  Innovations in Community Pharmacy Practice  (2 credits)
The speaker series introduces students to a variety of community pharmacy practice opportunities, assists community-oriented students seeking career guidance, motivates students to take an active approach to career planning, and encourages students seeking post-graduate community or ambulatory pharmacy residencies. The course will expose P2 and P3 student to influential community pharmacy managers, pharmacists, and regulators who exhibit one of the following qualities: Excellence through diversity; leadership through advocacy; pharmacist-conscious management strategies; evolution of practice models; innovation in patient-centered care; protection of the profession; commitment to continuous quality improvement in medication safety and delivery of care; and dedication to the ongoing education and development of student pharmacist and recent graduates. Invited guest lecturers lend perspective about their relative roles in pharmacy practice, the impact of their pharmacy in their communities, and additional topics as related to their qualifications as listed above. Guest lecturers present in pairs or triplets (i.e., pharmacy manager, staff pharmacist, and pharmacy resident) so students can discuss the roles of each position, as well as learn the qualifications and skills that each supervisor seeks in their subordinates during interviews for hire, annual reviews, and consideration for promotion.

PMD-840  Advanced Hospital Pharmacy Practice  (2 credits)
PMD-842  Advanced Motivational Interviewing  (2 credits)
This course is designed to introduce students to the disparity that exists in healthcare both here in the states and abroad, and get students involved in projects that make a difference for underserved communities. This elective consists of both lectures and hands-on experiences with populations in need. Students will participate in a minimum of three volunteer experiences within the Buffalo area, and work on one project for an international organization. While class hours are listed as 1-3 PM on Tuesdays, many of the volunteer opportunities will fall outside those hours. Students are expected to participate in a minimum of three volunteer experiences in the community, and type a 1-page journal entry/ reflection for each of these experiences.
PMD-844 Global Health in Pharmacy (2 credits)
Global Health in Pharmacy is a course that is designed to expose the pharmacy students to global health issues and differences between different global health systems. Additionally, students will learn about considerations in treating communicable and non-communicable diseases in low income countries, pharmacist roles/servant leadership opportunities in different countries, regulations regarding medication use, and acquisition outside of the USA, and opportunities that exist for pharmacists in global health. Some classes will be taught in an interdisciplinary setting with students from nursing and public health programs. In addition, students will be offered the opportunity to attend a trip to Buenos Aires, Argentina in the summer following the spring semester for an additional course credit.

PMD-845 Nuclear Pharmacy (3 credits)
This elective introduces students to the principles and practice of nuclear medicine and the role of the pharmacist.

PMD-846 Advances in Drug Discovery and Development (2 credits)
The goal of this course is to give the students in-depth understanding of the science and forces behind the discovery of novel drugs and treatment approaches. The lectures will cover all stages of the discovery and development process starting with the basic science, through the specific design of clinical trials and potential clinical applications. The lectures will be based on the analysis of primary literature in a case study format. Major breakthroughs and standard-of-care changing paradigms will be comprehensively discussed and analyzed. Student attendance and participation is a critical part of this course. Articles to be discussed during the class will be sent to the students prior to the class meeting session by a week.

PMD-847 Advocacy & Advanced Topics Women's Hlth (2 credits)
This elective will explore in greater detail the pharmacotherapy in women across the lifespan. This course will prepare pharmacy students to provide optimal care of women at all ages. This course will also provide students with a foundational knowledge in women's health policy, research and advocacy. Pharmacotherapeutic topics may include: infertility, infectious disease in women, specific topics surrounding use of contraception, use of hormone therapy and bioidenticals, pregnancy, lactation and toxicities, the postpartum period, conditions associated with pregnancy, and cancers specific to women. Topics covered in the area of policy and advocacy may include: access and barriers to care, equality in health care, inclusion of women and minorities in research, and gender roles.

PMD-848 Critical Care Pharmacotherapeutics (2 credits)
This elective course would focus on the unique considerations for a clinical pharmacist taking care of critically ill patient. It would prepare the student to understand basic principles of physiology, pharmacokinetics, and pharmacotherapy essential to the management of critically ill patients. Topics to be covered include: acid/base, hemodynamic parameters, pain/sedation/delirium, cardiopulmonary arrest, shock states, stress ulcer prophylaxis, renal replacement therapy, cardiovascular emergencies.

PMD-849 P3 IPPE Practice (0 credits)
The P3 Practice IPPE Rotation provides the opportunity for the student to test knowledge and skills they acquired through classes and previous pharmacy practice experiences through application with a clinical pharmacist preceptor. Under the supervision of their preceptors, students will be introduced to communicating with patients, care givers, providers, and other health professionals as well as research methods and process.

PMD-850 Practice IPPE (1 credits)
The focus of this course is to study herbal preparations and other phytomedicinals which are widely used by the general public as self-selected OTC products for therapeutic, preventive or prophylactic purposes. The course will be methodically classified by organ systems (e.g. nervous system, cardiovascular system, digestive system) and its relevant field of application (e.g. depression, anxiety and sleep disorders; congestive heart failure, arteriosclerosis; peptic ulcers, constipation). Emphasis will be placed on herbal constituents and products whose safety and efficacy are based not just on tradition but also on modern scientific testing. The course will further give an introduction into aspects related to safety, herb-d, herb-drug, herb-herb interactions, and quality and efficacy of herbal medicinal products. The role of pharmacists to assist consumers to select the safest, most proper and useful natural remedies will also be considered.

PMD-851 P3 IPPE Long Term Care (1 credits)
PMD-852 Long Term Care IPPE (1 credits)
PMD-853 Compounding Bootcamp (1 credits)
PMD-854 Advanced Compounding (1 credits)
PMD-855 International Pharmacy (0 credits)
PMD-856 International Pharmacy IPPE (0 credits)
PMD-859 Topics in Pharmacy Assessment (0 credits)
PMD-860 Topics in Pharmacy (0 credits)
PMD-861 Elective US IPPE (0 credits)
PMD-862 Advanced Compounding (2 credits)
This course will focus on applied concepts in contemporary pharmaceutical compounding/product development and will have both laboratory and classroom components. The laboratory component will deal with extemporaneous compounding of dosage forms such as gels, troches, lollipops, lip balm etc that have not been covered in the basic compounding course. The classroom component will include guest lectures, in-class presentations/discussions on topics such as beyond-use dating of compounded preparations, quality control, compounding pharmacy management and the related area of pharmaceutical product development. This will prepare the pharmacy student to recognize the value and importance of compounded formulations as well as the distinction from manufacturing. Note: This course deals with material and concepts beyond the scope of the Part III compounding Exam as required by the New York State Board of Pharmacy and is not intended as a review course for the aforementioned licensing exam.

PMD-863 Research Methods and Biostatistics (2 credits)
The course will cover the foundations of healthcare research. These include study design, sampling, measuring patients outcomes, in addition to data collection and processing in healthcare research. It will also cover the basic concepts in bio-statistical analyses. The course will carry on the foundation created in the "Biostatistics and Literature Evaluation" Course, but will also offer a hands-on experience to students in data manipulation and data analysis that can be typically used in a healthcare setting.
PMD-864 Current Topic in Drug Discovery & Development (2 credits)

PMD-866 Pharmacy Internship (0 credits)

The goal of this course is to expose the student to the complexity of US pharmacy practice and be able to identify key aspects and future directions of US pharmacy practice, this should assist them in the appreciation of the role of pharmacists as healthcare providers and advocates for improving the health of patients in their communities and across the US. Key competencies to be addressed include: US burden of disease, medication use management, social and economic health determinants, population resources and environment, pharmaceutical care in low resource settings, and contemporary pharmacy practice.

PMD-867 Advanced Self-Care (2 credits)

This course will provide the opportunity to learn more about the role of the pharmacist in the management of self-limiting illnesses as well as preventative and adjunctive self-care. There will be a focus on the most commonly encountered self-care topics in practice and the evaluation, recommendation, assessment and monitoring of self-care within complex patient cases. Students will have the opportunity to develop these skills across a variety of contexts including informal and formal patient case presentations.

PMD-869 Global Health & International Travel (3 credits)

Global Health in Pharmacy is a course that is designed to expose the pharmacy students to global health issues and differences between different global health systems. Additionally, students will learn about considerations in treating communicable and non-communicable diseases in low income countries, pharmacist roles/servant leadership opportunities in different countries, regulations regarding medication use, and acquisition outside of the USA, and opportunities that exist for pharmacists in global health. Some classes will be taught in an interdisciplinary setting with students from nursing and public health programs. In addition, students will be offered the opportunity to attend a trip to Buenos Aires, Argentina in the summer following the spring semester for an additional course credit.

PMD-871 Mgmt & Leadership Planning & Operations (2 credits)

This online elective is part of a three elective sequence required for the Pharmacy Manager Concentration (PMC). It can be taken after acceptance into the concentration or by permission from the instructor. The course can be taken in any sequence vis-à-vis the other two online PMC elective courses for the PMC. Each weekly two-hour online lesson will consist of materials on the Canvas® learning management system. These materials include Panopto® delivered podcasts that cover management/leadership, planning and operations topics. Each weekly Panopto® delivered podcast will have five (5) embedded quiz questions. And each week, individual students will also be tasked to answer more challenging questions as part of a weekly (asynchronous) online discussion. Tweets will be employed to clarify student understanding of the more difficult issues. The "wisdom" of experienced pharmacy managers will be tapped into from a variety of pharmacy practice settings using videos, tables, and sidebars with concise tips; and, listings of additional resources. Students will be required to complete a six-page term paper on an approved topic. And, a midterm examination and a final examination will need to be taken on Examsoft® (using Examity® online proctoring).

PMD-873 Finance Risk Mgmt and HR (2 credits)

This online elective is part of a three elective sequence required for the Pharmacy Manager Concentration (PMC). It can be taken after acceptance into the concentration or by permission from the instructor. The course can be taken in any sequence vis-à-vis the other two online PMC elective courses for the PMC. Each weekly two-hour online lesson will consist of materials on the Canvas® learning management system. These materials include Panopto® delivered podcasts that cover professional effectiveness, entrepreneurship, marketing and promotion topics. Each weekly Panopto® delivered podcast will have five (5) embedded quiz questions. And each week, individual students will be tasked to answer more challenging questions as part of a weekly (asynchronous) online discussion. Tweets will be employed to clarify student understanding of the more difficult issues. The "wisdom" of experienced pharmacy managers will be tapped into from a variety of pharmacy practice settings using videos, tables, and sidebars with concise tips; and, listings of additional resources. Students will be required to complete a six-page term paper on an approved topic. And, a midterm examination and a final examination will need to be taken on Examsoft® (using Examity® online proctoring).

PMD-875 Prof Effectiveness, Entr, Mktg and Promo (2 credits)

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PMD-877 MTM IPPE I (0 credits)

Purpose While partaking in the Medication Therapy Management Pharmacy IPPE Rotation the student will gain experience in providing MTM services which is recognized as a growing area in all areas of pharmacy practice. Students will be the learning the fundamentals of the MTM process in both training that involves simulated cases with the potential for real world integration. Students will receive the APhA MTM Training Certificate in the P2 year and successfully complete the required 5 post cases during this IPPE. Goals & Objectives The goal of this IPPE course is to expose the student to the expanding role Pharmacists play in pharmaceutical care with emphasis on the patient care process. The premise and focus will be on addressing Drug Related Problems (DRPS) with documentation of efforts via the MTM platform.
PMD-878 MTM IPPE II (1 credits)
Purpose While partaking in the Medication Therapy Management Pharmacy IPPE Rotation the student will gain experience in providing MTM services which is recognized as a growing area in all areas of pharmacy practice. Students will be the learning the fundamentals of the MTM process in both training that involves simulated cases with the potential for real world integration. Students will receive the APhA MTM Training Certificate in the P2 year and successfully complete the required 5 post cases during this IPPE. Goals & Objectives The goal of this IPPE course is to expose the student to the expanding role Pharmacists play in pharmaceutical care with emphasis on the patient care process. The premise and focus will be on addressing Drug Related Problems (DRPS) with documentation of efforts via the MTM platform.
Prerequisite(s): Take PMD-877

PMD-888 Aromatherapy, Hydrosols, But Plants Are So Much More (2 credits)
The purpose of this elective is to expose students to the diverse role whole plants can play in improving health and wellbeing. As society continues to turn to alternative health approaches it is imperative health care professionals are aware of various options patients may turn to. The course will explore the value of using an entire plant compared to buying over the counter plant supplements. It will focus on aromatherapy and hydrosols, but will also compare this to teas, tinctures, salves, etc. The course will start out with an introduction to aromatherapy and herbalism including definitions/terminology. It will then delve into plants in more detail and what each plant can offer, with a focus on plants used for aromatherapy and hydrosols.

PMD-898 Spanish for Pharmacy Practitioners (2 credits)
This elective course is a basic course in Spanish geared to dispensing pharmacy. It will include basic anatomy and disease state terminology, medication counseling, directions for medication use, and patient history terms.

PMD-901 Advanced Community Pharmacy (6 credits)
PMD-902 Ambulatory Care Rotation (6 credits)
The Advanced Pharmacy Practice Experience provides practice opportunities that require students to assume responsibility for the outcomes of drug therapy. Students develop mastery of the educational outcomes during five required and two elective rotations. Required rotations include acute care, ambulatory care, advanced institutional pharmacy, advanced community pharmacy and a health and wellness project. Students also choose two elective rotations covering a variety of pharmacy settings, such as long term care, nuclear pharmacy, home infusion, geriatrics, pediatrics, managed care, oncology and psychiatric pharmacy.

PMD-903 Institutional Clinical Rotation (6 credits)
PMD-904 Institutional Operations Rotation (6 credits)
The Advanced Pharmacy Practice Experience provides practice opportunities that require students to assume responsibility for the outcomes of drug therapy. Students develop mastery of the educational outcomes during five required and two elective rotations. Required rotations include acute care, ambulatory care, advanced institutional pharmacy, advanced community pharmacy and a health and wellness project. Students also choose two elective rotations covering a variety of pharmacy settings, such as long term care, nuclear pharmacy, home infusion, geriatrics, pediatrics, managed care, oncology and psychiatric pharmacy.

PMD-905 APPE Elective A (6 credits)
The Advanced Pharmacy Practice Experience provides practice opportunities that require students to assume responsibility for the outcomes of drug therapy. Students develop mastery of the educational outcomes during five required and two elective rotations. Required rotations include acute care, ambulatory care, advanced institutional pharmacy, advanced community pharmacy and a health and wellness project. Students also choose two elective rotations covering a variety of pharmacy settings, such as long term care, nuclear pharmacy, home infusion, geriatrics, pediatrics, managed care, oncology and psychiatric pharmacy.

PMD-906 APPE Elective B (6 credits)
The Advanced Pharmacy Practice Experience provides practice opportunities that require students to assume responsibility for the outcomes of drug therapy. Students develop mastery of the educational outcomes during five required and two elective rotations. Required rotations include acute care, ambulatory care, advanced institutional pharmacy, advanced community pharmacy and a health and wellness project. Students also choose two elective rotations covering a variety of pharmacy settings, such as long term care, nuclear pharmacy, home infusion, geriatrics, pediatrics, managed care, oncology and psychiatric pharmacy.

PMD-909 International APPE (0 credits)
The International APPE rotation experiences expose students to the complexity of global health issues and help them to be able to identify sources of information concerning global health topics. This experience should assist them in the appreciation of the role of healthcare providers as advocates for improving the health of patients in their communities and globally.
Course Types: Study Abroad