



RUTGERS HEALTH

Ernest Mario School of Pharmacy

Pharmacy Electives Handbook

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Electives for PharmD Students

The professional, research, and clinical electives offered at the Ernest Mario School of Pharmacy provide students with opportunities to develop an understanding of specialized fields of pharmacy or related disciplines, beyond what is provided in the required curriculum.

When you choose your electives, please remember that you will be drawing upon the skills acquired in these courses during your rotations and throughout your professional career. Your elective courses offer opportunities to broaden and enhance the depth of knowledge that will serve you throughout your professional lives.

Please check the number of credits as you plan your academic program each semester. As a full-time student, you should be registered for at least 12 and no more than 20 credits. If you wish to take more than 20 credits, you must fill out a [credit overload form](#).

See the [online scheduling grids](#) for a list of courses available for a given class year.

If you have any questions on registration, please check with the Office of Academic Services, School of Pharmacy. Call 848 445 6336 or e-mail: academicservices@pharmacy.rutgers.edu.

All PharmD students are required to take at least five electives, including one clinical elective in the 3rd professional year. If you are interested in the Honors Research Program or one of our dual degree programs, see: pharmacy.rutgers.edu for descriptions of these programs and check with your advisor before selecting your elective courses.

Electives are designed to develop problem solving, critical thinking, communication and clinical decision-making skills through small classroom, active learning environments, with a focus on application of knowledge to clinical situations. EMSOP offers Professional, Research, and Clinical Electives. Please see below for specific requirements.

Check the Schedule of Classes at <http://sis.rutgers.edu/soc/> for a listing of the courses offered in each semester and the exact time and location; not all courses are offered every academic year.

EMSOP Professional Electives

Course Name: ***Diet, Nutrition, and Disease Prevention***

Course Number: 30:158:402

Credits: 2.0

Class Standing: Professional year 1 or higher

Prerequisite:

Description: Course provides a systematic and thorough treatment of selected topics on diet and nutrition and their relationship to health and diseases. Basic biochemical mechanisms will be emphasized; fads and quackery will also be discussed. Students are encouraged to give an oral presentation or write a term paper on a selected topic.

Course Name: ***Pharmacogenomics and Precision Medicine***

Course Number: 30:158:409

Credits 2.0

Class Standing: Professional year 2 or higher

Prerequisite: Introduction to Pharmacology – 30:718:320

Description: A survey of polymorphisms (population and individual differences) in the pharmacokinetics and pharmacodynamics of therapeutic drugs. The genetics and molecular basis of these polymorphisms and examples of associated abnormal responses (idiosyncrasies, super, and sub- responsiveness) to therapeutic agents and sensitivity to environmental toxicants are stressed.

Course Name: ***Foundations of Drug Discovery***

Course Number: 30:715:451

Number:

Credits: 3.0

Class Standing: Professional year 1 or higher

Prerequisite: Undergraduate organic chemistry (I and II)

Description: This course provides an overview of the drug discovery process and provides a foundation for students interested in a career in drug discovery by applying both organic and biochemical principles. There are three parts to this course: (i) understanding the drug discovery process (2) common targets in drug discovery including receptors, kinases, GPCRs, ion channels, metabolic enzymes, and DNA; and (3) inhibitor design and evaluation including assay development, enzymology, PK/PD studies, and metabolism. This course is designed as an introductory

graduate course or an advanced undergraduate course for students who have taken two semesters of organic chemistry.

Course Name: ***Principles of Drug Design***

Course Number: 30:715:452

Number:

Credits: 3.0

Class Standing: Professional year 1 or higher

Prerequisite: Permission of instructor

Description: Course covers the drug discovery and development from the identification of novel drug targets to the introduction of new drugs into clinical practice. It covers basic principles of how new drugs are discovered with emphasis on lead identification, lead optimization, classification and kinetics of molecules targeting enzymes and receptors, pro-drug design and applications, and structure-based drug design methods. Recent advances in the use of computational and combinatorial chemistry in drug design are also presented. Invited lectures on recent developments and applications of drug design principles in the pharmaceutical industry enhance the course.

Course Name: ***Introduction to Research***

Course Number: 30:720:301

Credits: 2.0

Class Standing: Professional year 1 and permission of instructor

Description: This course is designed to give students an understanding of the nature of scientific investigation and how it differs from learning known facts in a field of study. In general, pharmacy students are taught didactically, i.e., known facts are given and assimilated. To advance research capacity, students need to learn how to gather information, assimilate and, with deductive and inductive reasoning, generate novel theory and hypotheses. The course demonstrates how these tools have been used to advance pharmaceutical sciences and provides the tools to engage in this process. Format includes classroom teaching, independent learning, team learning, and written assignments. Faculty will present concepts and use interactive discussion to further the thought processes involved.

Course Name: ***Principles of Research in Pharmacy***

Course Number: 30:720:401

Credits: 3.0

Class Standing: Professional years 1 and 2 and permission of instructor

Prerequisites: No formal prerequisite, but course extends topics covered in Introduction to Research

Description: This course is designed to give students an understanding of the principles of experimental design for bench and clinical research. The course includes lectures, independent and team learning, class discussion, and written assignments.

Course Name: ***Economic Modeling of Pharmaceuticals and Other Health Interventions***

Course Number: 30:725:541

Credits: 3.0

Class Standing: Professional year 2 or higher

Prerequisite:

Description: Course covers the principles of economic modeling of pharmaceuticals (i.e., pharmacoeconomic models) and other health improving interventions. such as devices, diagnostics, and new models of delivering care, as well as health promotion programs. Students will learn how to build a model using established methods, critique published models, consider ethical issues of modeling, and discuss how models are used by healthcare insurers and policymakers to inform the adoption of new treatments in the U.S. using the Academy of Managed Care Pharmacy (AMSP) format or other value assessment frameworks.

Course Name: ***Motivating Change as a Health Ambassador for Diabetes Mellitus***

Course Number: 30:725:350

Credits: 2.0

Class Standing: Professional year 1 or higher

Prerequisite

Description: This course is designed to increase understanding of diabetes mellitus and provide students with the necessary tools to help patients take control of their disease with effective treatment. Using an interdisciplinary approach, including skills development in behavior modification and motivational interviewing, this course provides students with a broad understanding of the disease and the means to provide effective healthcare.

Course Name: ***Community Practice Management***

Course Number: 30:725:427

Credits: 2.0

Class Standing: Professional year 2 or 3

Prerequisite:

Description: This course is designed to make students aware of opportunities for involvement in community pharmacy. It provides an overview of the range of community settings and enables students to see a broad range of professional options.

Course Name: ***Hospital Practice Management***

Course Number: 30:725:428

Credits: 2.0

Class Standing: Professional year 1 or 2

Prerequisite

Description: This course provides a survey of practice and management issues related to the hospital practice environment. Subjects include clinical pharmacy practice, philosophy and standards, organizational issues, as well as emerging trends.

Course Name: ***Introduction to the Pharmaceutical Industry***

Course Number: 30:725:429

Credits: 2.0

Class Standing: Professional year 1 or 2

Prerequisite

Description: This course provides an overview of the pharmaceutical industry, focusing on the drug development process, including clinical research, regulatory affairs, and marketing. Pharmaceutical company executives provide guest lectures to enhance the course by focusing on their individual areas of expertise.

Course Name: ***Leadership for Pharmacy Professionals***

Course Number: 30:725:482

Credits: 2.0

Class Standing: Professional year 1 (by invitation only)

Prerequisite

Description: This course is designed to introduce students to broad concepts of leadership and professionalism in pharmacy practice. The format includes interactive lectures, as well as group projects, presentations, and practical exercises. Topics include leadership theory, emotional intelligence, Myers- Briggs test, presentation skills, professional writing, etiquette, ethics, conflict resolution, and networking.

Course Name: ***Patient Advocacy and Healthcare Policy***

Course Number: 31:725:526

Credits: 2.0

Class Standing: Professional year 3

Prerequisite

Description: Developing strategies that lead to sound healthcare policy outcomes is more important now than at any time in history. The course covers critical issues in contemporary health policy, such as pharmaceutical pricing, drivers of healthcare cost, and the role of state & federal governments in shaping the future of healthcare and patient access. The course also helps students understand the role of patient advocacy organizations and professional societies in influencing health policy. Students participate in class discussions with external experts and develop/present a strategic advocacy plan using one stakeholder perspective.

Course Name: ***Pharmaceutical Marketing***

Course Number: 31:725:583

Credits: 2.0

Class Standing: Professional year 2 or higher

Prerequisite

Description: This course focuses on the skills that pharmaceutical marketers need to be successful with an in-depth understanding of the development of pharmaceutical advertising, promotional pieces, and messages. The course also provides information on potential marketing career options in the pharmaceutical industry.

Course Name: ***Economic Modeling of Pharmaceuticals and Other Health Interventions***

Course Number: HOPE 9510

Credits: 3.0

Class Standing: Professional year 2 or higher

Prerequisite:

Description: Given the controversies about high-cost health care, innovators such as drug, device, and academic scientists are increasingly being called upon by healthcare purchasers to provide evidence demonstrating the financial value of their products and services. Health economic modeling is an established technique for meeting this evidentiary need. This course will cover the principles and methods of economic modeling of pharmaceuticals (i.e., pharmacoeconomic models) and other health improving interventions such as devices, diagnostics, and new models of delivering care, and health promotion programs (e.g., screening; adherence).

Note: Students may take up to two approved professional electives offered under agreements with other Rutgers units. See pages 14-17 below for course descriptions and see [descriptions of our dual degree options](#) on our website. Contact the Office of Academic Affairs for information about requirements and registration.

EMSOP Research Electives

EMSOP faculty members offer research opportunities that fulfill elective requirements. Interested students should contact faculty members directly to express interest and obtain approval. Then they should contact the Office of Academic Services to complete registration with the required paperwork. Note: students may use only two semesters of research for Professional Elective credit. While additional research can be completed for course credit, these additional courses will not satisfy Professional Elective Degree requirements.

The professor must be a faculty member in one of the academic departments of the School. The Office of Academic Services will complete your registration for these electives, based upon an email or memo from the professor with whom the research will be conducted. The email needs to include the name of the student completing the research, the student's RUID, and the name of the faculty member with whom the research is being done.

Students may only use two semesters of research classes for Professional Elective Degree credit. While additional research can be completed for course credit, the additional courses *will not* be counted toward Professional Elective Degree Requirements.

Research courses must offer a minimum of 2.0 credits to fulfill elective requirements. Students are expected to devote time to the course at the rate of three hours a week per credit, including time in class, in laboratory, in conference with the teacher, or in reading, writing and preparing for class. Thus, each 2-credit research course requires a minimum of six hours of research per week, for a total of 84 hours for the semester. Schedules for research will be determined by the student in consultation with the faculty member. Delays in course completion or recording of grades may affect the student's date of graduation. Research courses are available in the following fields:

Chemical Biology

Medicinal Chemistry

Pharmacology

Pharmaceutics

Pharmacy Practice

Information regarding the type of research being conducted by faculty is available online at <https://pharmacy.rutgers.edu/research/>

EMSOP Clinical Electives

Clinical electives are designed to develop problem solving, critical thinking, communication and clinical decision-making skills in small classroom, active learning environments, with a focus on application of knowledge to clinical situations. PharmD students are required to complete one clinical elective in the P3 year.

You will preference your choice of clinical elective in your P2 year in preparation for enrollment in your P3 year.

Course name: *Pediatric Pharmacy Practice*
Course number: 31:725:561
Credits: 2.0
Class standing: Professional year 3
Description: Course introduces the concepts of pharmacy practice as these relate to the expanding field of pediatrics. Focus includes a variety of therapeutic techniques and an understanding of the issues that impact pediatric care.

Course name: *Women's Health Issues*
Course number: 31:725:562
Credits: 2.0
Class standing: Professional year 3
Description: Course is taught through interactive case-based lectures, debates, group projects, presentations, and practical exercises. Students will improve their skills in patient interviewing techniques, geriatric assessment, SOAP note writing, and MTM documentation. The goal is to develop the student's problem-solving skills and empathy in the care and management of geriatric patients, who often present with multiple disease states, polypharmacy, and challenging issues.

Course name: *Gerontology Pharmacy Practice*
Course number: 31:725:563
Credits: 2.0
Class standing: Professional year 3

Description Course is taught through interactive case-based lectures, debates, group projects, presentations, and practical exercises. Students will improve their skills in patient interviewing techniques, geriatric assessment, SOAP note writing, and MTM documentation. The goal is to develop the student's problem-solving skills and empathy in the care and management of geriatric patients, who often present with multiple disease states, polypharmacy, and challenging issues.

Course name: *Ambulatory Care: Applying Key Concepts*

Course number: 31:725:575

Credits: 2.0

Class standing: Professional year 3

Description This topic-based course is designed to equip students with knowledge of primary literature and guidelines that can be used to apply evidence-based recommendations to patients in the ambulatory care setting. Students will gain an understanding of patient-care practice models, focusing on the Joint Commission of Pharmacy Practitioners Pharmacists' Patient Care Process. Students will review publications, present literature to the class, and apply their knowledge to an evolving patient case that will mimic clinical practice in the ambulatory care setting.

Course name: *Emergency Medicine Pharmacotherapy*

Course number: 31:725:576

Credits: 2.0

Class standing: Professional year 3

Description This course familiarizes pharmacy students with key disease states encountered by the emergency medicine pharmacist. Didactic lectures are presented by experienced emergency medicine pharmacists with an emphasis on evidence-based medicine and practical bedside applications. Students are expected to facilitate peer-to-peer and collaborative learning respectively through topic discussion, case development, and simulation lab participation.

Course name: *Concepts in Palliative and End-of-Life Care*

Course number: 31:725:577

Credits: 2.0

Class standing: Professional year 3

Description This course is designed to introduce students to the emerging field of palliative care and pharmacy practice issues related to the care of patients with non-curable, advanced illness or those at the end-of-life. Topics include communication skills, clinical decision-making, control of symptoms, management of complications, psychosocial and spiritual care, and care of the dying patient. The goal is to develop critical thinking skills in provision of palliative care pharmacy practice and compassion for patients and caregivers living with a serious or terminal illness.

Course name: *Strategies in HIV Therapy*

Course number: 31:725:578

Credits: 2.0

Class standing: Professional year 3

Description This course provides students with an in-depth overview of HIV/AIDS management. It covers various topics, including the intricacies of providing patient-specific antiretroviral therapy, management of antiretroviral and AIDS- related complications, global HIV/AIDS policy and advocacy, and sociological/psychological implications of HIV. Each student will be assigned to a group, which will tackle patient cases and current topics in HIV.

Course name: *Advanced Pharmacotherapy Applications*

Course number: 31:725:579

Credits: 2.0

Class standing: Professional year 3

Description Using case-based learning, course enhances and develops problem-solving skills for management of complex patient cases like those encountered in the inpatient setting. Students work in small groups, present findings to the class, and initiate open discussions. Topics include trauma, pediatrics, toxicology, infectious diseases, oncology, cardiology, and nephrology.

Course name: *Concepts in Psychiatric Pharmacotherapy*

Course number: 31:725:581

Credits: 2.0

Class standing: Professional year 3

Co-requisite: Neuropsychiatric Therapeutics

Description	Course explores in-depth the disease states from therapeutics, as well as other topics such as autism, eating disorders, personality disorders, and fictitious disorders. The course is interactive, as students conduct a simulated patient interview, write SOAP notes, and present topics.
Course name:	<i>Critical Care Pharmacotherapy</i>
Course number:	31:725:582
Credits:	2.0
Class standing:	Professional year 3
Description:	Course introduces the concepts of pharmacy practice within the context of critical care facilities.

Electives Offered by Other Rutgers Units

PharmD students may choose up to two selected courses offered by other schools at Rutgers. Only courses listed in this section qualify as professional electives.

Rutgers Business School (RBS)

Course name:	<i>Pharmaceutical Industry: Issues, Structure & Dynamics</i>
Course number:	22:223:607
Credits:	3.0
Class standing:	Professional Year 2 or higher
Prerequisites:	U.S. Health Care Systems (22:373:622) and 3.2 cumulative GPA
Description	<i>Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective.</i> The course is designed to give the students an understanding of the successful development of a new drug. In this context, the students will be exposed to different concepts of drug development phases, the role of the Food and Drug Administration in the development of new drugs, patenting and licensing, drug pricing, product life cycle, genomics and biotechnology, and other related issues. The course uses guest speakers from industry to provide students with practical perspectives on drug development.

Course name:	<i>Legal, Regulatory, and Ethical Issues in the Pharmaceutical Industry</i>
Course number:	22:373:621
Credits:	3.0
Class standing:	Professional year 2 or higher
Prerequisites:	3.2 cumulative GPA

Description *Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective.* Successful managers of pharmaceutical firms function in a multifaceted, ever-changing, increasingly international environment of diverse challenges: legal, regulatory, and ethical. This course will help students develop the knowledge, skills, and ethical compass to succeed in this environment. The topics covered include research ethics, bioethics, intellectual property, healthcare reform, and drug marketing. This course exposes students to a diversity of perspectives and is enhanced with high quality guest lecturers. The course uses Harvard Business School cases to give students opportunities to learn by making executive-level decisions in real-world business contexts.

Course name: *U.S. Health Care System and Pharmaceutical Managed Markets*

Course number: 22:373:622

Credits: 3.0

Class standing: Professional year 2 or higher

Prerequisites: 3.2 cumulative GPA

Description *Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective*

Course name: *Market Access & Reimbursement for Drugs*

Course number: 22:630:684

Credits: 3.0

Class standing: Professional year 2 or higher

Prerequisites: 3.2 cumulative GPA; U.S. Health Care Systems (22:373:622) highly recommended

Description *Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective.* This course explores the complex variety of transactions that take place between the development and manufacturing of a pharmaceutical product and financial mechanisms that influence the payer, provider, and the patient, including pharmaceutical pricing models; innovative contracting; reimbursement and coding; global access; and cause and effect of patient cost offsets.

School of Public Health (SPH)

Course name: *Health Systems and Policy*
Course number: PHCO 0501
Credits: 3.0
Class standing: Professional year 2 or higher
Prerequisites: 3.2 cumulative GPA

Description *Offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course in the MPH curriculum. The course has three goals: (1) Introduce students to the socioeconomic and cultural contexts of health perceptions & health behavior, including service utilization. This includes an examination of theoretical orientations to disease causation & health disparities; (2) Focus on the organization and financing of health care in the U.S. as it relates to health care costs, & issues of access, equity & quality; (3) Introduce students to the health & social care issues of special populations & the systems of care available to these groups, including economically disadvantaged women & infants, the frail elderly, persons with a developmental disability or chronic mental illness, & disenfranchised minority populations with no entitlements to health, educational or social services.*

Course name: *Principles of Epidemiology*
Course number: PHCO 0502
Credits: 3.0
Class standing: Professional year 2 or higher
Prerequisites: 3.2 cumulative GPA

Description *At the conclusion of the course, students will be able to identify important public health data sources; explain the main epidemiological study designs and their major strengths and weaknesses; explain the usual steps in the investigation of an infectious disease outbreak; and use critical skills in reading public health journals.*

Course name: *Introduction to Biostatistics*
Course number: PHCO 0504
Credits: 3.0
Class standing: Professional year 2 or higher
Prerequisites: 3.2 cumulative GPA; *offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course in the MPH curriculum.*

Description At the conclusion of this course, students will be able to distinguish among the basic types of data; describe the normal curve and its major characteristics in relation to parametric statistics; calculate descriptive statistics; describe the relationship of statistics to hypothesis testing; understand the nature of Type I and Type II errors; explain the concept of statistical power and how it can be calculated; apply basic statistical test procedures; decide which parametric or non-parametric test to apply to test a statistical hypothesis; understand the concepts and applications of linear regression; apply statistical software programs to solve common public health problems; and critically review and comprehend basic statistical discussions in the public health literature.

Course name: *Health Education and Behavioral Science in Public Health*

Course number: PHCO 0505

Credits: 3.0

Class standing: Professional year 2 or higher

Prerequisites: 3.2 cumulative GPA. *Offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course in the MPH curriculum.*

Description Course introduces students to learning and behavioral science principles, theories and practices that provide the framework for the practice of health education. Students will be introduced to health education in a public health context, will be required to perform tasks frequently requested of health educators, and will be introduced to nationally endorsed competencies of certified health education specialists.

School of Health Professions (SHP)

Course name: *Regulatory and Ethical Requirements in Clinical Investigations*

Course number: BPHE 5521

Credits: 3.0

Class standing: Professional year 2 or higher

Prerequisites: 3.2 cumulative GPA

Description *Offered by SHP; course satisfies requirement as a Pharmacy Professional Elective.* Course presents foundational knowledge of regulatory and ethical requirements impacting the conduct of clinical investigation, most notably intervention studies conducted by the pharmaceutical and medical device industries. Course is offered on-line.