

# RUTGERS

Ernest Mario School  
of Pharmacy

## Professional Electives

Developed by  
Office of Academic Services  
Ernest Mario School of Pharmacy

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## Thoughts on Professional Electives

The professional electives offered at the Ernest Mario School of Pharmacy are intended to provide students with the opportunity to develop more specialized understanding of some of the more unique and interesting segments of the field of pharmacy.

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 an opportunity to broaden and enhance the depth of knowledge that will serve you throughout your professional lives.

## Registering for Electives

Please remember when you register for electives to check the number of credits for which you are registered. The School expects students to be registered for at least 12.0 credits during each semester. Remember, also, that you are required to have a total of five professional electives.

Index Numbers for the courses to be offered each semester are listed online at <http://sis.rutgers.edu/soc/>. Please note that electives are taught on both the undergraduate (30) and graduate (31) levels. Thus, you will need to look carefully at the course number for the elective you are interested in and use the appropriate part of the schedule to determine the index number for the semester.

The **Scheduling Grids** that list the courses available for a given class year are online at [https://pharmacy.rutgers.edu/content/schedule\\_classes\\_final\\_exams](https://pharmacy.rutgers.edu/content/schedule_classes_final_exams)

If you have any questions on registration, please check with the Office of Academic Services located in Room 102 of William Levine Hall. Call 732-445-2675 x600 or e-mail: [jmdecker@rci.rutgers.edu](mailto:jmdecker@rci.rutgers.edu).

**If you are interested in the Honors Research Program or any dual degree option, please check with your advisor before selecting your elective courses. Check the School of Pharmacy website ([pharmacy.rutgers.edu](http://pharmacy.rutgers.edu)) for additional information.**

## Research Electives

Registration in research courses requires written permission of the professor with whom research is being conducted. The professor must be a faculty member in one of the academic departments of the School.

Information regarding the type of research being conducted by faculty is available online at <http://pharmacy.rutgers.edu>. Scroll down to the list of **Departments** and click on the department of your choice. Then scroll down and click on **Faculty/Staff** to find the list of faculty members and their research areas or areas of specialization.

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.

## Caveats

Students are only allowed to 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.

## Grading

Research courses are graded with letter grades. Assignment of final grades will be made by the faculty with whom the research has been conducted. The final grade will be based upon the work completed by the student and the expectations as outlined by the faculty member and agreed to by the student at the start of the research project. It is imperative that any research done for degree credit be completed within the time frame of the semester. Delays in the recording of grades may affect the student's date of graduation.

## Total Hours of Research

A minimum of 2.0 credits must be completed by a student to receive degree credit for the course. As defined in Section 10.2.4.B of the Rutgers University Policy Library, students will be 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, a minimum of 6 hours per week of research is to be conducted for 2.0 credits. 84 hours of research must be completed by the end of the semester to complete the course and receive a grade. Schedules for research will be determined by the student in consultation with the professor.

### Course Name

### Course Number

<i>Research in Chemical Biology</i>	30:158:495 or 497 (496 or 498 in spring)
<i>Research in Medicinal Chemistry</i>	30:715:495 or 497 (496 or 498 in spring)
<i>Research in Pharmacology</i>	30:718:495 or 497 (496 or 498 in spring)
<i>Research in Pharmaceutics</i>	30:721:495 or 497 (496 or 498 in spring)
<i>Research in Pharmacy Practice</i>	30:725:495 or 497 (496 or 498 in spring)

## Didactic Electives

Please check the Schedule of Classes at <http://sis.rutgers.edu/soc/> for a listing of the courses offered in a given semester and the exact time and location. *Note:* Not all courses are offered every academic year.

### PHARMACY PROFESSIONAL ELECTIVES OFFERED BY ERNEST MARIO SCHOOL OF PHARMACY

Course Name:	<i>Diet, Nutrition, and Disease Prevention</i>
Course Number:	30:158:402
Instructor:	Chung S. Yang, PhD
Credits:	2.0
Class Standing:	Professional year 1 or higher
Prerequisite:	—
Description:	The course gives a systematic and thorough treatment of selected topics on diet and nutrition as well as their relationship to health and diseases. Basic biochemical mechanisms will be emphasized. Faddism 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:	<i>Medicinal Chemistry: Research Techniques and Principles</i>
Course Number:	30:715:451
Instructor:	Joseph Rice, PhD
Credits:	3.0
Class Standing:	Professional year 1 or higher
Prerequisite:	Undergraduate organic chemistry (I and II)
Description:	Basic course for students preparing to do research in medicinal chemistry. Topics covered include information management, computer methods, basic laboratory techniques, bioassay techniques, metabolism, prodrugs, and quantitative structure-activity relationships.
Course Name:	<i>Principles of Drug Design</i>
Course Number:	30:715:452
Instructor:	Longqin Hu, PhD
Credits:	3.0
Class Standing:	Professional year 3
Prerequisite:	Permission of instructor
Description:	Course provides students with an understanding of the process of drug discovery and development from the identification of novel drug targets to the introduction of new drugs into clinical practice. It covers the 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, as well as structure-based drug design methods. Recent advances in the use of computational and combinatorial chemistry in drug design are also presented. The course is further enhanced with invited lectures on recent developments and applications of drug design principles in the pharmaceutical industry.

Course Name: ***Herbals and Nutraceuticals***  
Course Number: 30:715:453  
Instructor: Department of Medicinal Chemistry  
Credits: 2.0  
Class Standing: Professional year 1 or higher  
Prerequisite: —  
Description: This course is designed to provide an overview of herbal medicines as they relate to many of today's medical problems including weight control, immune system support, sexual health, cholesterol, diabetes, fatigue, insomnia, depression and cancer treatment.

Course Name: ***Theoretical Aspects of Pharmacology***  
Course Number: 30:718:401  
Instructor: Sungchul Ji, PhD  
Credits: 2.0  
Class Standing: Professional year 2 or higher  
Pre/Co-requisite: Introduction to Pharmacology – 30:718:320  
Description: Introduction to emerging theoretical concepts and principles in the areas of biochemistry, molecular biology, cell biology, physiology, and human genomics. Theoretical concepts and principles surveyed will be applied to pharmacologically relevant topics such as receptor-ligand interactions, signal transduction, genotype-phenotype coupling, and others.

Course Name: ***Pharmacogenetics***  
Course Number: 30:718:409  
Instructor: Michael Iba, PhD  
Credits: 2.0  
Class Standing: Professional year 1 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: ***Introduction to Research***  
Course Number: 30:720:301  
Instructor: Andrew Gow, PhD  
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 the known facts in a field of study. In general, the science that is taught to pharmacy students is done didactically, i.e. known facts are given and assimilated. In order to advance the Pharmacy field in a research capacity it is necessary for students to learn how to gather information, assimilate and through the use of deductive and inductive reasoning generate novel theory and hypothesis.

The purpose of this course is to give the students the tools required to engage in this process and to demonstrate how these tools have been used to advance the pharmaceutical sciences. The course includes classroom teaching, independent learning, team learning, and written assignments. Faculty will present concepts to the students and use interactive discussion to further the thought processes involved. Course materials, assignments, grades and evaluations will be administered using the Sakai website.

Course Name: ***Bench Research in Pharmacy***  
Course Number: 30:720:401  
Instructor: Andrew Gow, PhD  
Credits: 2.0  
Class Standing: Professional years 1 and 2 and permission of instructor  
Prerequisite: 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 involved in experimental design as it pertains to bench research. The course includes lectures, independent learning, team learning, and, class discussion, and written assignments.

Course Name: ***Gerontology Pharmacy Practice***  
Course Number: 30:725:422  
Instructor: Mary Wagner, PharmD, Timothy Reilly, PharmD, and Deepali Dixit, PharmD  
Credits: 2.0  
Class Standing: Professional year 3  
Prerequisite: —  
Description: The 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: ***Medical Writing***  
Course Number: 30:725:423  
Instructor: Evelyn Hermes-DeSantis, PharmD  
Credits: 2.0  
Class Standing: Professional year 2 or higher  
Prerequisite: —  
Description: This course covers practical applications of technical writing required of pharmacists in the health care system. As pharmacists are being called upon to produce more written information concerning drugs, this course provides students with the tools needed to meet these demands and improve their written communication skills.

Course Name:	<b><i>History of Pharmacy</i></b>
Course Number:	30:725:424
Instructor:	John L. Colaizzi, PhD
Credits:	2.0
Class Standing:	Professional year 1 or higher
Prerequisite:	—
Description:	A study of the profession and practice of pharmacy over its nearly 5,000 year history. Emphasis is placed on the relationships between pharmacy and other healthcare professional fields, especially medicine, and on the development of the profession in the United States. Current trends, problems, and opportunities in pharmacy are considered in light of scientific, historical, cultural, social, ethical, technical, economic, and political trends. Opportunities are provided for students to enhance their own skills in critical thinking, in the analysis of professional issues, in writing and in verbal communications.
Course Name:	<b><i>Community Practice Management</i></b>
Course Number:	30:725:427
Instructor:	Donna M. Feudo, RPh
Credits:	2.0
Class Standing:	Professional year 3
Prerequisite:	—
Description:	Designed to make students aware of the opportunities for involvement in community pharmacy; this course offers students opportunities to engage in the total community pharmacy experience.
Course Name:	<b><i>Hospital Practice Management</i></b>
Course Number:	30:725:428
Instructor:	Joseph DiCubellis, RPh
Credits:	2.0
Class Standing:	Professional year 3
Prerequisite:	Pharmacy Practice Management
Description:	This course provides a survey of practice and management issues related to the hospital practice environment. Subjects include clinical pharmacy practice, practice philosophy, standards of practice, organizational issues, among others.
Course Name:	<b><i>Introduction to the Pharmaceutical Industry</i></b>
Course Number:	30:725:429
Instructor:	Joseph A. Barone, PharmD, Post-Doctoral Pharmaceutical Industry Fellows
Credits:	2.0
Class Standing:	Professional year 1
Prerequisite:	—
Description:	While providing an overview of the pharmaceutical industry, this course focuses on the drug development process, including clinical research, regulatory affairs, and marketing. Pharmaceutical company executives focus on their individual areas of expertise as they serve as guest lecturers.



Course Name: ***Pediatric Pharmacy Practice***  
Course Number: 30:725:481  
Instructor: Christine Robinson, PharmD  
Credits: 2.0  
Class Standing: Professional year 3  
Prerequisite: —  
Description: This course provides an introduction to 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: ***Leadership for Pharmacy Professionals***  
Course Number: 30:725:482  
Instructor: Joseph Barone, PharmD  
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 a number of 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: ***Adventures in Pharmacy Practice***  
Course Number: 30:725:483  
Instructor: Evelyn Hermes-DeSantis, PharmD  
Credits: 2.0  
Class Standing: Professional year 1 or higher  
Prerequisite: —  
Description: The course is a complement to the required Pharmacy Practice Management course. Topics of study include contemporary subjects that have a direct impact on pharmacy practice, such as automation, politics, ethics, “pharmacy practice in the news,” and the future of pharmacy practice. The format includes a variety of activities including debates among students and in-class discussions.

Course Name: ***Women's Health Issues***  
Course Number: 30:725:484  
Instructor: Ashmi Philips, PharmD  
Credits: 2.0  
Class Standing: Professional year 3  
Prerequisite: —  
Description: This course covers a wide variety of issues and situations that affect women today. Topics include the reproductive life cycle, contraception, abortifacients, childbirth, post-partum issues, menopause, breast cancer, osteoporosis,

sexually transmitted diseases, eating disorders, muscular-skeletal Issues, and other timely topics.

Course Name: ***Herbals and Alternative Medicines***  
Course Number: 30:725:485  
Instructor: Rupal Mansukhani, PharmD  
Credits: 2.0  
Class Standing: Professional year 3  
Prerequisite: —  
Description: This course covers multiple topics related to the physiology of the human body and how it is affected by the use of natural remedies and alternative forms of medicine. Areas covered include the major systems of the body and how specific herbs affect the body.

Course Name: ***Clinical Research Design***  
Course Number: 30:725:486  
Instructor: Dong-Churl Suh, PhD, MBA  
Credits: 2.0  
Class Standing: Professional year 1 or higher  
Prerequisite: —  
Description: This course presents theoretical and practical principles of designing and conducting clinical research and clinical trials. Topics include basic concepts of clinical research design, FDA and pharmacy research, development of protocols; characteristics of phase I-IV trials, types of clinical research design, sample size determination, selection and use of statistical methods appropriate to various designs, methods and issues related to outcomes assessment alongside clinical trials, and standards for reporting clinical trials.

Course Name: ***Introduction to Pharmacoepidemiology***  
Course Number: 30:725:488  
Instructor: Tobias Gerhard, PhD  
Credits: 2.0  
Class Standing: Professional year 2 or higher  
Prerequisite: —  
Description: Introduces basic concepts of pharmacoepidemiology including pharmacovigilance and its role in drug regulation, study designs and methods, and basic statistical tools and data resources for pharmacoepidemiological studies.

Course Name: ***Concepts in Palliative and End-of-Life Care***  
Course Number: 31:725:577  
Instructors: Daniel Abazia, PharmD  
Credits: 2.0  
Class Standing: Professional year 3  
Prerequisite: —  
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. Topic areas to be covered 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 a student's critical thinking skills in the provision of palliative care pharmacy practice as well as compassion for patients and caregivers living with a serious or terminal illness.

Course Name: *Advanced Pharmacotherapy Applications*  
 Course Number: 31:725:579  
 Instructor: Zachariah Thomas, PharmD  
 Credits: 2.0  
 Class Standing: Professional year 3  
 Prerequisite: —  
 Description: Advanced Pharmacotherapy Applications is intended to enhance and develop problem-solving skills related to the management of complex patient cases similar to those encountered in the inpatient setting. This course uses case-based learning and students work in small groups. Cases are presented by individual groups to the entire class followed by an open discussion. Topics include trauma, pediatrics, toxicology, infectious diseases, oncology, cardiology and nephrology.

Course Name: *Advanced Neuropsychiatric Pharmacology*  
 Course Number: 31:725:581  
 Instructor: Mei Liu, PharmD  
 Credits: 2.0  
 Class Standing: Professional year 3  
 Prerequisite: Co-requisite: Neuropsychiatric Therapeutics  
 Description: The course explores in-depth the disease states from therapeutics, as well as other topics such as autism, eating disorders, personality disorders, and factitious disorders. The course is interactive, as students have the opportunity to conduct a simulated patient interview, write SOAP notes, and present topics.

Course Name: *Critical Care Pharmacotherapy*  
 Course Number: 31:725:582  
 Instructor: Liza Barbarello Andrews, PharmD  
 Credits: 2.0  
 Class Standing: Professional year 3  
 Prerequisite: —  
 Description: This course provides an introduction to the concepts of pharmacy practice within the context of critical care facilities.

Course Name: *Pharmaceutical Advertising*  
 Course Number: 31:725:583  
 Instructor: Bruce Epstein  
 Credits: 2.0

Class Standing: Professional year 2 or higher  
 Prerequisite: —  
 Description: This course focuses on the skills that pharmaceutical marketers need in order to be successful. Provides an in-depth understanding of the development of pharmaceutical advertising, promotional pieces and messages. Also provides information on potential marketing career options in the pharmaceutical industry.

Course Name: ***Managed Care***  
 Course Number: 31:725:584  
 Instructor: Saira Jan, PharmD  
 Credits: 2.0  
 Class Standing: Professional year 2 or higher  
 Prerequisite: —  
 Description: This course provides an introduction to the concepts of pharmacy practice as it relates to managed care. The course focuses on issues surrounding the practice of pharmacy in a managed care environment, including drug selection, clinical efficacy in ambulatory care involving utilization and outcome, benefit plans and prescribing behaviors, as well as recognition of the key stakeholders in managed care. The course addresses the application of managed care principles to pharmacy practice and discusses the impact of managed care on pharmacists working in community, ambulatory, and hospital environments.

#### **COURSES OFFERED BY RUTGERS BUSINESS SCHOOL- NEWARK & NEW BRUNSWICK (RBS)**

Course Name: ***Pharmaceutical Industry: Issues, Structure & Dynamics***  
 Course Number: 22:223:607  
*Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective*  
 Credits: 3.0  
 Class Standing: Professional Year 3  
 Prerequisite: U.S. Health Care Systems (22:373:622) and 3.2 cumulative GPA  
 Description: The objective of this course is 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: **Legal, Regulatory, and Ethical Issues in the Pharmaceutical Industry**  
 Course Number: 22:373:621  
*Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective*  
 Credits: 3.0  
 Class Standing: Professional year 3  
 Prerequisite: 3.2 cumulative GPA  
 Description: 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:	<b><i>U.S. Health Care Systems</i></b>
Course Number:	22:373:622 <i>Offered by RBS; course satisfies requirement as a Pharmacy Professional Elective</i>
Credits:	3.0
Class Standing:	Professional year 3
Prerequisite:	3.2 cumulative GPA
Description:	Course focuses on the organization of the U S healthcare environment and the role of the pharmaceutical industry. Topics include the nature and characteristics of the health care system, public / private sector roles, health care markets and competition, impact of managed care and insurance, congressional proposals and regulatory characteristics, health policy, health care reform strategies, and the role of patients and consumers. Emphasis will be placed on how these influences relate to the pharmaceutical industry and the role of the pharmaceutical company in the current health care environment.

## COURSES OFFERED BY SCHOOL OF PUBLIC HEALTH (SPH)

Course Name:	<b><i>Health Systems and Policy</i></b>
Course Number:	PHCO 0501 <i>Offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course for PharmD/MPH students</i>
Credits:	3.0
Class Standing	Professional years 1-3
Prerequisite:	3.2 cumulative GPA
Description:	The course has three goals: (1) Introduce students to the socioeconomic and cultural contexts of health perceptions and health behavior, including service utilization. This includes an examination of theoretical orientations to disease causation and health disparities; (2) Focus on the organization and financing of health care in the U.S. as it relates to health care costs, and issues of access, equity and quality; (3) Introduce students to the health and social care issues of special populations and the systems of care available to these groups, including economically disadvantaged women and infants, the frail elderly, persons with a developmental disability or chronic mental illness, and disenfranchised minority populations with no entitlements to health, educational or social services.

Course Name: ***Principles of Epidemiology***  
Course Number: PHCO 0502  
*Offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course for PharmD/MPH students*  
Credits: 3.0  
Class Standing: Professional years 1-3  
Prerequisite: 3.2 cumulative GPA  
Description: At the conclusion of the course, students will be able to identify a number of 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 Environmental Health***  
Course Number: PHCO 0503  
*Offered by SPH; course **does not** satisfy requirement as a Pharmacy Professional Elective, but is a required core course for MPH students*  
Credits: 3.0  
Class Standing: Professional years 1-3  
Prerequisite: 3.2 cumulative GPA  
Description: This course explores the way in which particular characteristics of our environment potentially affect health. The course examines health problems associated with biological, chemical, physical, and radiological agents, how they impact food safety, infectious disease, air quality (indoors, outdoors), water quality, and land resources in in the community and occupational settings. Course also reviews policies intended to improve public health through mitigation of environmental impacts.

Course Name: ***Introduction to Biostatistics***  
Course Number: PHCO 0504  
*Offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course for PharmD/MPH students*  
Credits: 3.0  
Class Standing: Professional years 1-3  
Prerequisite: 3.2 cumulative GPA  
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.

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Course Name:	<b><i>Health Education and Behavioral Science in Public Health</i></b>
Course Number:	PHCO 0505 <i>Offered by SPH; course satisfies requirement as a Pharmacy Professional Elective and is a required core course for PharmD/MPH students</i>
Credits:	3.0
Class Standing:	Professional years 1-3
Prerequisite:	3.2 cumulative GPA
Description:	This 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.