

Course Descriptions

This is the Course Descriptions section of the 1997-1999 University of Minnesota Pharmacy Bulletin.



Course Symbols

- , The comma, used in prerequisite listings, means "and."
- § Credit will not be granted if credit has been received for the course listed after this symbol.
- ¶ Concurrent registration is required (or allowed) in the course listed after this symbol.
- # Approval of the instructor is required for registration.
- A prerequisite course listed by number only (e.g., prereq 5246) is in the same department as the course being described.
- A hyphen between course numbers (e.g., 3142-3143-3144) indicates a sequence of courses that must be taken and successfully completed in the order listed.
- A class rank prerequisite (e.g., 3rd yr) states the minimum class standing a student must hold to register for a course without special permission from the Academic Standing Committee.

Course Descriptions

The college's courses are offered by four divisions: Medicinal Chemistry, Pharmaceutics, Pharmacy Practice, and Experimental and Clinical Pharmacology. Medicinal chemistry courses (biochemistry of medicinals, therapeutic agents, biotechnology, microbiology/immunology) and pharmacology courses focus on understanding the actions and therapeutic uses of various types of medications that can affect organ systems, immune functions, and infections. Pharmaceutics courses (drug delivery, pharmacokinetics, biopharmaceutics) concentrate on principles involved in drug dosage formulations; dosage form design; and how drugs are absorbed, distributed, and eliminated from the body. The experimental and clinical pharmacology courses include the pharmacotherapy sequence that applies basic information to the patient by focusing on the nature and cause of various disease states and the treatment of these disorders. Pharmacy practice encompasses a pharmaceutical care sequence, which examines the various roles of the pharmacist, and a pharmacy management and public policy sequence.

Entry-level Doctor of Pharmacy (Pharm.D.) Courses

MedC 5140. Therapeutics of Natural Substances. (2 cr; prereq organic chemistry, physiology; A-F only) Biological nature, chemistry, toxicity, drug interactions, and human use of common natural plant products.

MedC 5151. Biochemistry of Medicinals I. (4 cr; prereq ¶Phcy 5921; A-F only) Ferguson Biochemistry topics required for understanding pharmacodynamic action and therapeutic use of medicinal agents.

MedC 5152. Biochemistry of Medicinals II. (4 cr; prereq 5151, ¶Phcy 5922; A-F only) Kallick Intermediary metabolism of carbohydrates, lipids, amino acids, and nucleic acids and how these pathways are affected by therapeutic agents.

MedC 5161. Therapeutic Agents I. (3 cr; prereq 5152; A-F only) Hanna Basic principles of drug design, metabolism, mechanisms of action, and receptor interaction.

MedC 5162. Therapeutic Agents II. (2 cr; prereq 5152, 5161; A-F only) R Johnson Medicinal chemical properties and therapeutic uses of autonomic, anti-allergic, antihistaminic, cardiovascular, and renal drugs.

MedC 5163. Therapeutic Agents III. (3 cr; prereq 5162, ¶Phcy 5102; A-F only) Abul-Hajj Therapeutic properties and uses of drugs affecting the central nervous, endocrine, and intermediary metabolism systems.

MedC 5164. Therapeutic Agents IV. (3 cr; prereq 5152, 5172; A-F only) Rimmel Therapeutic properties and uses of anti-infective agents.

MedC 5165. Therapeutic Agents V. (2 cr; prereq 5161, 5164; A-F only) Vince Therapeutic properties and uses of antiviral and antineoplastic agents.

MedC 5170. Pharmaceutical Biotechnology. (2 cr; prereq 5152; A-F only) Shier Biotechnology in the basic and clinical pharmaceutical sciences; monoclonal antibodies, recombinant DNA techniques, and preparation and use of biotechnology-derived agents in diagnosing and treating disease.

MedC 5172. Pharmaceutical Microbiology and Immunology. (3 cr; prereq 5152; A-F only) Wagner Students examine biological mechanisms of the immune system to understand therapeutic methods and potential complications. Mechanism of antibody and cell-mediated immunity; mechanisms of action of vaccines, immunosuppressives, and anti-tumor immunotherapeutics.

MedC 5174. Human Nutrition and Drug Therapy. (pending faculty approval) Basic concepts of human nutrition and clinical application.

MedC 5190. Medicinal Chemistry Research Thesis. (pending faculty approval) Final thesis describing medicinal chemistry research conducted.

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MedC 5195. Medicinal Chemistry Research Seminar Presentation. (pending faculty approval) Students present research-related topics to peer and faculty evaluators. Emphasizes preparation and presentation of a formal seminar or lecture and verbal communication skills.

MedC 5200. New Drug Development. (1 cr) Abul-Hajj New drug development process in the U.S. pharmaceutical industry.

MedC 5202. New Drug Development. (2 cr) Abul-Hajj New drug development process in the U.S. pharmaceutical industry.

MedC 5495. Vistas in Medicinal Chemistry Research. (1 cr; S-N only) Abul-Hajj Selected topics of contemporary interest in medicinal chemistry research.

MedC 5714H. Chemical Aspects of Drug Metabolism and Bioactivation. (2 cr; prereq #: A-F only; offered alt yrs) Hanna Chemical aspects of drug metabolism and toxicity. Biotransformation mechanisms of drugs and other xenobiotics.

MedC 5715H. Advanced Concepts in Drug Design. (2 cr; prereq #: A-F only; offered alt yrs) Wagner Current approaches to rational drug design.

MedC 5970. Directed Studies. (1-5 cr; prereq #) Directed studies in medicinal chemistry.

MedC 5999. Special Problems. (Cr ar; prereq #) Research in medicinal chemistry.

Phar 1001. Orientation to Pharmacy. (1 cr; S-N only) Benson For prepharmacy students. The pharmacist's role, issues faced by the pharmacy profession, and information about the University of Minnesota College of Pharmacy.

Phar 3210. Terminology of the Health Sciences. (2 cr, \$HSU 5210) Zaske Programmed learning course with the most current usage and traditional components; the language of health care delivery.

Phar 5007. Biology of Aging. (2 cr, \$HSU 5031, \$PMed 5817, \$SAPh 5007) Thompson Comparative biology and aging at molecular and cellular levels in various plant and animal systems. Emphasis on human biology, including pathobiology and theories of aging, nutrition, immunology, and a review of organ systems.

Phar 5009. Multidisciplinary Perspectives on Aging. (4 cr, \$AdEd 5440, \$CPsy 5305, \$Gero 5105, \$HSU 5009, \$Nurs 5780, \$PubH 5737, \$Soc 5960, \$SW 5024) Biological, social, and psychological aspects of aging; theories of aging; death and bereavement; issues and problems of older adults in the United States; human services and their delivery systems; public policy and legislation; environments and housing; advocates; retirement.

Phar 5210. Applied Terminology of the Health Sciences. (3 cr) Zaske Advanced medical terminology and its application in the context of patient medical records and clinical cases.

Phar 5232. Drugs and Prison Health. (2 cr; S-N only) Kingston Drug use and abuse in correctional institutions.

Phar 5290. Specialty Clerkship. (1-12 cr; prereq #) Advanced or specialty practice experience in a patient care setting. Provides students with experience in clinical, patient-oriented pharmacy services. Forty hours of on-site experience required for each credit.

Phar 5291. Specialty Externship. (1-12 cr; prereq #) Advanced or specialty practice experience in a patient care setting. Provides students with experience in drug distribution or pharmacy management and administration. Forty hours of on-site experience required for each credit.

Phar 5512. Pathophysiology and Therapeutics: Dermatology. (1 cr; prereq 2nd-yr pharmacy student; A-F only) Larson Pathophysiology of skin disorders; appropriate therapeutic approaches; monitoring techniques to ensure efficacy and minimize toxicity.

Phar 5515. Neuroanatomy. (1 cr; prereq 2nd-yr pharmacy student; S-N only) Graves Basic neuroanatomy and neurophysiology for the health sciences student. Emphasis on terminology and preparation for more advanced courses. Self-study, videotape format.

Phar 5517. Pharmacotherapy for the Elderly. (2 cr; 2nd-yr pharmacy student; A-F only) Physiologic changes of aging; changes in drug disposition and specific concerns with drug use in the elderly.

Phar 5770H. Hospital Pharmacy Seminar. (1 cr; prereq #: A-F only) Hadsall Contemporary topics in hospital pharmacy research.

Phar 5811. Pharmaceutical Care I. (4 cr; prereq ¶Phcy 5921; A-F only) Strand The pharmacy profession, the practice of pharmaceutical care, health care beliefs, drug information retrieval, professional communications, problem-solving skills.

Phar 5812. Pharmaceutical Care II. (4 cr; prereq 5811, ¶Phcy 5922; A-F only) Cipolle Pharmaceutical care, professional responsibilities, patient care process including assessment, care planning, evaluation, and documentation.

Phar 5821. Pharmacotherapy I. (3 cr; prereq 5812, ¶Phcy 5923; A-F only) Uden Pathophysiology and pharmacotherapy of conditions in patients who receive pharmaceutical care from community pharmacists. Common medical indications for drug therapy and drug therapy problems. Prescription and nonprescription therapies.

Phar 5822. Pharmacotherapy II. (4 cr; prereq Phcl 5101, Phmc 5460, Phsl 5100, ¶MedC 5163, ¶Phcl 5102; A-F only) Straka Pathophysiology and pharmacotherapy of common cardiovascular disorders.

Phar 5824. Pharmacotherapy IV. (2 cr; prereq MedC 5163, Phcl 5101, Phmc 5460, ¶Phcy 5926; A-F only) O'Connell Pathophysiology and pharmacotherapy of common pulmonary disorders.

Phar 5825. Pharmacotherapy V. (3 cr; prereq MedC 5164, Phmc 5460, ¶Phcy 5926; A-F only) Rotschafer
Pathophysiology and pharmacotherapy of common infectious diseases.

Phar 5826. Pharmacotherapy VI. (pending faculty approval)
Pathophysiology and pharmacotherapy of common renal, fluid, and electrolyte disorders.

Phar 5827. Pharmacotherapy VII. (pending faculty approval)
Pathophysiology and pharmacotherapy of common central nervous system, psychiatric, and neurologic disorders.

Phar 5828. Pharmacotherapy VIII. (pending faculty approval)
Pathophysiology and pharmacotherapy of common hematologic, oncologic, and immunologic disorders.

Phar 5829. Pharmacotherapy: Endocrine Disorders. (2 cr; prereq Phcl 5101, ¶MedC 5163, ¶Phcl 5102; A-F only) Guay
Pathophysiology and pharmacotherapy of common endocrine disorders.

Phar 5830. Pharmacy and the Health Care System. (4 cr; A-F only) Schondelmeyer
Delivery of pharmaceuticals and pharmacy services in the U.S. health care system, issues in hospital and community practice, characteristics of the pharmaceutical industry, economic and financial issues in delivering pharmaceutical services.

Phar 5831. Patient Assessment. (pending faculty approval)
Prepares student to systematically collect subjective and objective information from patients. Classroom and clinical experience in taking histories and conducting a basic physical examination.

Phar 5832. Statistics and Drug Literature Evaluation. (3 cr; prereq 5811, ¶Phcy 5924; A-F only) Gross
Statistical concepts, biostatistical data analysis methods, and principles of study design for understanding original research in pharmacy and health care. Critical evaluation of the implications of drug literature.

Phar 5833. Introduction to Clerkships. (pending faculty approval)
Prepares students for clerkships by providing information about patient confidentiality, professional behavior, and universal precautions.

Phar 5834. Pharmacy Practice Management. (pending faculty approval)
Principles of pharmacy management, including inventory control, purchasing, pricing, financial analysis, and personnel management.

Phar 5836. Ethical Issues in Pharmacy. (pending faculty approval)
Nature and influences of moral and ethical considerations on decisions and actions in pharmacy practice.

Phar 5838. Pharmacy and the Law. (pending faculty approval)
Minnesota and federal laws, rules, and court decisions affecting the practice of pharmacy. Legal control mechanisms, peer regulation, licensing, unprofessional conduct, labeling, drug distribution channels, the Cosmetic Act, and other regulations and topics.

Phar 5840. Community Externship. (pending faculty approval)
Students assigned to community pharmacies and involved in community practice activities 40 hours per week for 5 weeks.

Phar 5841. Institutional Externship. (pending faculty approval)
Students assigned to hospital pharmacies and involved in hospital practice activities 40 hours per week for 5 weeks. Students participate in pharmacy administration, drug distribution, IV preparation, and clinical services.

Phar 5842. General Acute Patient Care Clerkship. (pending faculty approval)
Supervised clinical pharmacy experience in inpatient settings. Students responsible for drug-related needs of individual patients 40 hours per week for 5 weeks. Students attend clinical rounds, take medication histories, monitor drug therapy, provide patient education, and research patient-specific drug information questions.

Phar 5843. Ambulatory Patient Care Clerkship. (pending faculty approval)
Supervised five-week clinical pharmacy experience in an ambulatory setting. Students responsible for drug-related needs of individual patients.

Phar 5844. Pediatrics Patient Care Clerkship. (pending faculty approval)
Supervised five-week clinical pharmacy experience in a pediatric setting. Students provide and manage appropriate pharmacotherapeutic interventions for pediatric patients. Understanding basic pharmacokinetic and pharmacodynamic differences between adult and pediatric patients.

Phar 5845. Patient Care Clerkship. (pending faculty approval)
Supervised five-week clinical pharmacy experience in various patient care settings. Specialties in adult, pediatrics, inpatient, community practice, cardiology, infectious diseases, geriatrics, nutrition, oncology, transplant, psychiatry, nephrology, home health care, epilepsy, and others.

Phar 5846. Specialty Acute Patient Care Clerkship. (pending faculty approval)
Supervised clinical pharmacy experience in inpatient settings. Students responsible for drug-related needs of individual patients 40 hours per week for 5 weeks. Specialties in adult, pediatrics, cardiology, infectious diseases, geriatrics, nutrition, oncology, transplant, psychiatry, nephrology, pharmacokinetics, and others.

Phar 5850. Therapeutic Drug Monitoring. (pending faculty approval)
Applying clinical pharmacokinetics and assay methodologies to patient care; assessing drug therapy outcomes.

Phar 5851. Self-Care Drug Focus. (3 cr; prereq 5821; A-F only) J Johnson
Expands on information presented in Phar 5821. Diagnostic material and applications in assisting the patient in self-care.

COURSE DESCRIPTIONS

Phar 5852. Community Pharmacy Management. (pending faculty approval)
Management techniques needed in community pharmacy practice, with emphasis on marketing and service.

Phar 5853. Pharmacy Practice in Ambulatory Setting. (3 cr; prereq 2nd-yr pharmacy student; A-F only) T Larson
Pharmaceutical care in an ambulatory (community) setting, and the role of a general practitioner.

Phar 5854. Communications for the Health Sciences. (pending faculty approval)
Communication models and theories as they relate to health services. Applying theoretical communications knowledge to practical situations with role playing and peer critique.

Phar 5855. Institutional Pharmacy Management. (pending faculty approval)
Management techniques needed in various institutional pharmacy settings. Integrating distributive and clinical components of institutional practice.

Phar 5856. Drug Use Review and Management. (pending faculty approval)
Principles of drug use review in various health care settings, including optimizing quality and minimizing cost.

Phar 5857. Pharmaceutical Economics and Public Policy. (pending faculty approval)
Economic and public policy aspects of the U.S. health care system. Health economic principles and trends applied to the pharmaceutical market.

Phar 5860. Community Patient Care Clerkship. (pending faculty approval)
Supervised five-week clinical pharmacy experience in a community pharmacy in which the primary focus is on patient care activities.

Phar 5861. Research Clerkship. (pending faculty approval)
Supervised five-week experience in medicinal chemistry, pharmaceuticals, or pharmacy practice research.

Phar 5862. Community Pharmacy Management Clerkship. (pending faculty approval)
Supervised five-week experience using management techniques in a community pharmacy.

Phar 5863. Institutional Pharmacy Management Clerkship. (pending faculty approval)
Supervised five-week experience using management techniques in an institutional setting.

Phar 5864. Specialized Management Clerkship. (pending faculty approval)
Supervised five-week experience in community chain store management, community independent ownership, hospital management, chain corporate management, long-term care, managed care, wholesale management, industry marketing, industry sales management, or other management area.

Phar 5865. Pharmacy Clerkship I. (1 cr; S-N only) Benson
Introduction to pharmacy practice. Students observe pharmacists in various roles and health care settings.

Phar 5866. Pharmacy Clerkship II. (1 cr; prereq 2nd-yr pharmacy student; A-F only) Lepinski
Students gain experience with patient work-ups, care planning, and documentation using simulated or real patients.

Phar 5867, 5868, 5869. Elective Patient Care Clerkship I, II, III. (pending faculty approval)
Supervised clinical pharmacy experience in various patient care settings. Students responsible for drug-related needs of individual patients 40 hours per week for 5 weeks.

Phar 5870. Geriatric Assessment. (4 cr; prereq 3rd-yr pharmacy student; A-F only) O'Connell
Multidisciplinary approach to comprehensive assessment of geriatric patients including function, health status, quality of life, strengths, financial status, and diversity issues.

Phar 5880. Pharmacotherapy: Gastrointestinal Disorders. (1 cr; prereq MedC 5163, Phcl 5101, Phcl 5102, PhsI 5100; A-F only) Guay
Pathophysiology and pharmacotherapy of common gastrointestinal disorders.

Phar 5881. Clinical Toxicology. (pending faculty approval)
Poison treatment and prevention, including managing poison emergencies and salicylate, acetaminophen, narcotic, tricyclic antidepressant, carbon monoxide, heavy metal, and alcohol overdoses; drug dependence; dangers of household products.

Phar 5890. Pharmacotherapy Seminar Presentation. (pending faculty approval)
Students present pharmacy-related topics to peer and faculty evaluators. Emphasizes preparation and presentation of a formal seminar or lecture and verbal communication skills.

Phar 5891. Community and Ambulatory Pharmacotherapy Seminar Presentation. (pending faculty approval)
Students present pharmacy-related topics to peer and faculty evaluators. Emphasizes preparation and presentation of a formal seminar or lecture and verbal communication skills.

Phar 5892. Management Seminar Presentation. (pending faculty approval)
Students present management-related topics to peer and faculty evaluators. Emphasizes preparation and presentation of a formal seminar or lecture and verbal communication skills.

Phar 5893. Pharmacy Practice Research Seminar Presentation. (pending faculty approval)
Students present research-related topics to peer and faculty evaluators. Emphasizes preparation and presentation of a formal seminar or lecture and verbal communication skills.

Phar 5894. Seminar Preparation. (pending faculty approval)
Students learn how to prepare a seminar or lecture, including literature review, verbal presentation skills, and how to prepare slides, overheads, and handouts.

Phar 5895. Pharmacotherapy Thesis. (pending faculty approval)
Final thesis describing patient care-oriented activities conducted.

Phar 5896. Community and Ambulatory Pharmacotherapy Thesis. (pending faculty approval)
Final thesis describing community and ambulatory patient care-oriented activities conducted.

Phar 5897. Management Thesis. (pending faculty approval)
Final thesis describing management-oriented activities conducted.

Phar 5898. Pharmacy Practice Research Thesis. (pending faculty approval)
Final thesis describing patient care-orientated research conducted.

Phar 5970. Directed Studies. (1-5 cr; prereq #)
Directed studies in pharmacy practice.

Phar 5999. Special Problems. (Cr ar; prereq #)
Research in clinical practice.

Phcy 5921. Pharmacy Laboratory I. (1 cr; prereq ¶MedC 5151, ¶Phar 5811, ¶Phmc 5450; A-F only)
Rommel
Integrating pharmacy curriculum in a lab setting.

Phcy 5922. Pharmacy Laboratory II. (1 cr; prereq ¶MedC 5152, ¶Phar 5812, ¶Phmc 5451; A-F only)
Rommel
Integrating pharmacy curriculum in a lab setting.

Phcy 5923. Pharmacy Laboratory III. (1 cr; prereq ¶Phar 5821, ¶Phmc 5452; A-F only)
Rommel
Integrating pharmacy curriculum in a lab setting.

Phcy 5924. Pharmacy Laboratory IV. (1 cr; prereq ¶MedC 5172, ¶Phar 5832, ¶Phmc 5460; A-F only)
Zimmerman
Integrating pharmacy curriculum in a lab setting.

Phcy 5925. Pharmacy Laboratory V. (1 cr; prereq ¶MedC 5164, ¶Phar 5822, ¶Phar 5829; A-F only)
Zimmerman
Integrating pharmacy curriculum in a lab setting.

Phcy 5926. Pharmacy Laboratory VI. (1 cr; prereq ¶Phar 5824, ¶Phar 5825, ¶Phmc 5471; A-F only)
Zimmerman
Integrating pharmacy curriculum in a lab setting.

Phcy 5927. Pharmacy Laboratory VII. (pending faculty approval)
Integrating pharmacy curriculum in a lab setting.

Phcy 5928. Pharmacy Laboratory VIII. (pending faculty approval)
Integrating pharmacy curriculum in a lab setting.

Phmc 5450. Introduction to Drug Delivery. (2 cr; prereq ¶Phcy 5921; A-F only)
Jafari
Mathematics associated with drug dispensing; technology of common pharmaceutical dosage forms.

Phmc 5451. Principles of Drug Delivery I. (3 cr; prereq 5450, ¶Phcy 5922; A-F only)
Grant
Phenomenological and theoretical bases of equilibrium and steady-state processes controlling drugs and dosage forms.

Phmc 5452. Principles of Drug Delivery II. (4 cr; prereq 5451, ¶Phcy 5923; A-F only)
Suryanarayanan
Phenomenological and theoretical bases of kinetic and dynamic processes controlling drugs and dosage forms.

Phmc 5460. Pharmacokinetics. (4 cr; prereq calc II, 5452 or #; A-F only)
Sawchuk
Physiological basis for drug absorption, distribution, metabolism, and excretion; use of mathematical principles to describe these processes.

Phmc 5471. Biopharmaceutics I. (3 cr; prereq 5452, 5460, ¶Phcy 5926; A-F only)
Wiedmann
Applied theory of dosage form design for optimal drug activity and bioavailability (oral, transdermal, and respiratory routes).

Phmc 5472. Biopharmaceutics II. (pending faculty approval)
Applied theory of dosage form design for optimal drug activity and bioavailability (all other routes).

Phmc 5490. Pharmaceutics Research Thesis. (pending faculty approval)
Final thesis describing pharmaceutics research conducted.

Phmc 5495. Pharmaceutics Research Seminar Presentation. (pending faculty approval)
Students present research-related topics to peer and faculty evaluators. Emphasizes preparation and presentation of a formal seminar or lecture and verbal communication skills.

Phmc 5681. Basic Pharmacokinetic Modeling. (2 cr; prereq 5460; A-F only)
Sawchuk
Computer simulation of compartmental and physiologic modeling in pharmacokinetics.

Phmc 5681H. Basic Pharmacokinetic Modeling. (2 cr; prereq 5460; A-F only)
Sawchuk
See Phmc 5681. An additional project is required.

Phmc 5730H. Pharmaceutics Seminar. (1 cr; prereq #; A-F only)
Contemporary topics in pharmaceutics research.

Phmc 5970. Directed Studies. (1-5 cr; prereq #)
Directed studies in physical pharmacy, biopharmaceutics, or pharmacokinetics.

Phmc 5999. Special Problems. (Cr ar; prereq #)
Problems in formulating, producing, and evaluating pharmaceutical products.

Contributing Departments

Phcl 5101. Pharmacology I. (5 cr; prereq 2nd-yr pharmacy student; A-F only)
Dunham
Pharmacologic principles and actions of drugs.

Phcl 5102. Pharmacology II. (3 cr; A-F only)
Dunham
Pharmacologic principles and actions of drugs.

Phsl 3070. Neurophysiology. (2 cr; prereq human anatomy; A-F only)
Fohlmeister
Principles of nervous system function studied through neuroanatomy and neurophysiology.

Phsl 5100. Systems Physiology. (5 cr; prereq biochem, human anatomy; A-F only)
Katz
Physiological principles of circulation, respiration, digestion, excretion, metabolism, and endocrine gland function.