PHARMACY (PHARMACY)

PHARMACY 125 – EXPLORING PHARMACY I
2 credits.

Provides opportunities to integrate and apply introductory concepts and content related to Pharmaceutical Sciences, Social Administrative Pharmacy, and Pharmacy Practice. Students also develop academic and interpersonal skills helpful for success in current and future courses.
Requisites: None
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Describe roles, responsibilities, and training of pharmacists to provide care for patients and populations in a variety of practice settings
Audience: Undergraduate

2. Explain the roles of pharmacists related to public health, health literacy and health disparities
Audience: Undergraduate

3. Explain the process of gaining admission into and matriculating through a Doctor of Pharmacy program
Audience: Undergraduate

4. Create a holistic approach for successful transition from high school to college
Audience: Undergraduate

5. Develop connections to peers, student mentors, faculty and staff
Audience: Undergraduate

6. Identify common medical terms and medication names
Audience: Undergraduate

PHARMACY 126 – EXPLORING PHARMACY II
1 credit.

Expands upon the learning foundations provided in PHARMACY 125. Additional opportunities to develop pre-professional plans, explore unique pharmacy career opportunities and learn about pharmacy student co-curricular and professional development experiences. Prepare students to successfully participate in the pharmacy admissions process.
Requisites: PHARMACY 125
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Explain the pharmacy school admissions process
Audience: Undergraduate

2. Create SMART goals regarding pharmacy admissions, pre-professional development, and unique opportunities in pharmacy practice and pharmacy student co-curricular opportunities
Audience: Undergraduate

3. Create a pharmacy admissions personal statement
Audience: Undergraduate

4. Construct reflections about guest speaker presentations, job shadow experiences, a mock interview, and cultural awareness as it relates to pharmacy careers and patient care
Audience: Undergraduate

5. Analyze a pharmacy organization or pharmacy-focused event
Audience: Undergraduate

6. Revise a pre-pharmacy resume originally developed in PHARMACY 125
Audience: Undergraduate

PHARMACY 225 – PHARMACY EXPLORATION SEMINAR
2 credits.

Provides opportunities to explore pharmacy career paths, develop pre-professional plans, learn about pharmacy student co-curricular and professional development experiences, and prepare to successfully participate in the pharmacy admissions process.
Requisites: Not open to students with credit for PHARMACY 125 or 126
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Describe roles, responsibilities, and training of pharmacists to provide care for patients and populations in a variety of practice settings
Audience: Undergraduate

2. Examine the roles of pharmacists related to public health, health literacy, and health disparities
Audience: Undergraduate

3. Explain the holistic student experience throughout the Doctor of Pharmacy program
Audience: Undergraduate

4. Assemble a competitive application for admission into the Doctor of Pharmacy program
Audience: Undergraduate

5. Develop connections to peers, student mentors, faculty and staff
Audience: Undergraduate

6. Identify common medical terms and medication names
Audience: Undergraduate

PHARMACY 423 – PHARMACY INTEGRATED LEARNING LABORATORY
1 credit.

Provides an interdivisional foundation for pharmacy students to understand many aspects of pharmacy through a wide variety of activities. Delivers a broad understanding of the pharmacist's public health and patient advocacy role with opportunities to practice basic calculations related to drug formulations in the context of safety, drug stability, and patient care. Fosters development of communication skills with peers and patients and be introduced to patient counseling principles. Includes active participation in a longitudinal group experience with an assigned senior in the community to apply course content.
Requisites: Declared in the Doctor of Pharmacy Program with first year standing only
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Develop and enhance oral and written communication skills with patients/clients, peers, and pharmacists. (EO6)
Audience: Graduate

2. Employ interpersonal and intergroup behaviors in order to collaborate effectively in a variety of situations and reflect on teams and teamwork by: a) describing the process of team development and the roles and practices of effective teams and b) reflecting on individual and team performance for performance improvement. (EO7, IPEC TT1 & TT8)
Audience: Graduate

3. While applying the Pharmacists' Patient Care Process, discover aspects of patient-centered care by reflecting on the patient's/client's perspective on health, social, economic and psychological needs. (EO11, EO12, EO13)
Audience: Graduate

4. Apply social and behavioral principles and theories, including empathy, to patient communication. (EO8)
Audience: Graduate

5. Retrieve professional and lay literature in order to acquire information about therapeutic agents (i.e. evidence-based drug information) and to provide health information to patients and the public. (EO1)
Audience: Graduate

6. Identify the pharmacists' role in public health/health promotion activities while increasing awareness of community-based resources and identifying potential causes of health disparities. (EO12, EO13, EO14)
Audience: Graduate

7. Accurately measure and weigh drug products and complete calculations necessary for pharmaceutical preparations and pharmacy practice. (EO5)
Audience: Graduate

8. Complete drug dissolution and drug dilution activities and discuss how various drug properties (e.g. solubility, stability) can impact drug performance. (EO2)
Audience: Graduate

PHARMACY 434 – PHARMACEUTICAL GENETICS AND IMMUNOLOGY
2 credits.

Facilitates the understanding and application of the principles of pharmaceutical genetics, immunology, and biotechnology.
Requisites: Declared in Doctor of Pharmacy program
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Explain how genotypes relate to human disease.
Audience: Graduate

2. Explain how model organism research underpins our knowledge of human genetic diseases.
Audience: Graduate

3. Describe how genetic/genomic technologies are used in research and can be applied to pharmacy.
Audience: Graduate

4. Explain how pharmacogenomics can identify and be used as markers for drug response.
Audience: Graduate

5. Describe how the immune system both causes and fights disease.
Audience: Graduate

6. Describe how biotechnology can be used to develop and produce drugs.
Audience: Graduate

PHARMACY 451 – MARGINALIZED POPULATIONS IN HEALTHCARE AND MEDIA
1 credit.

Provides opportunities for learning about healthcare barriers and facilitators: health disparities; and health outcomes using popular culture movies, and media that portray marginalized communities. Provides opportunities to discuss how their identities influence their view of the movie's theme and how bias may impact care provided in a healthcare setting.
Requisites: Declared in the Doctor of Pharmacy program
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2022
Learning Outcomes: 1. Critique the portrayal of marginalized communities in the movies regarding health disparities and public health.
Audience: Graduate

2. Describe and differentiate how one's own identity influences the relationship to the community in the movie and how intrinsic biases may impact the care provided to marginalized communities.
Audience: Graduate

3. Analyze how the social determinants of health and systemic racism impact a character's health and wellbeing.
Audience: Graduate

4. Describe and differentiate attitudes and stereotypes concerning marginalized communities and how this may impact a person's individualized clinical and self-care.
Audience: Graduate

PHARMACY 490 – SELECTED TOPICS IN PHARMACY
1-2 credits.

Various topics related to the Pharmacy profession.
Requisites: Declared in Doctor of Pharmacy program
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2024

PHARMACY 563 – DRUG HISTORY: DANGEROUS DRUGS AND MAGIC BULLETS
2 credits.

A history of medicinal substances and dangerous drugs in wider context, with a focus on gender, race, class, business, and other analytical categories. "Medicines" and "drugs" change over time -- and concepts of risk, danger, legality, and even scientific evidence are elastic. Histories of laws, regulations, and key historical actors, as well as specific drug biographies, will be provided.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Outline the key theoretical issues in history of medicine and drugs.
Audience: Graduate

2. Explain the relationship, including explanatory models of change, between specific medicines and drugs and society.
Audience: Graduate

3. Critically assess the historiographies of the history of medicine.
Audience: Graduate

4. Evaluate the reputations of specific medicines, medicinal substances and drugs.
Audience: Graduate

5. Effectively communicate conclusions regarding the history of medicines and drugs.
Audience: Graduate

6. Apply historical understandings to contemporary issues regarding drug regulation and political conflicts.
Audience: Graduate

PHARMACY 564 – PSYCHEDELIC HISTORY: SACRED PLANTS, SCIENCE & PSYCHOTHERAPY
3 credits.

A history of psychedelics in the U.S. and more globally. Read texts that were formative in the development of the history of psychopharmacology, pharmaceuticals, and the "war on drugs." Examine readings that represent different themes, subfields, or areas of research interest within the history of psychedelics (medicine science). Beyond biomedicine, types of analysis include: consumerism, class, ethnicity, gender, and military history. Histories of laws, regulations, and key historical actors, as well as specific drug biographies, will be provided.
Requisites: Declared in MS Pharmaceutical Sciences: Psychoactive Pharmaceutical Investigation
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Outline the key theoretical issues in the history and historiographical discussions relevant to psychedelics in biomedicine and society.
Audience: Graduate

2. Describe the role of the psychedelics in treatment settings and as part of indigenous and religious rituals.
Audience: Graduate

3. Analyze and present primary and lay literature; apply knowledge to present problems and situations.
Audience: Graduate

4. Critique and construct tools to help shape new understandings of psychedelic historiography
Audience: Graduate

PHARMACY/I SY E 608 – SAFETY AND QUALITY IN THE MEDICATION USE SYSTEM
3 credits.

Addresses the problems of medication errors and quality in health care, problem resolutions, methods of assessment, and intervention implementation and quality management.
Requisites: Declared in Doctor of Pharmacy program with third year standing
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Recognize types, sources, and contributors to error within the medication use system.
Audience: Undergraduate

2. Explain the influence of work systems and human factors on the development of safe processes for improving safety within the medication use system.
Audience: Undergraduate

3. Apply tools for identifying, analyzing, and anticipating errors within the medication use system (e.g., error reporting systems, root cause analysis, failure modes and effects analysis) and use these to develop safer processes.
Audience: Undergraduate

4. Describe characteristics of healthcare settings that contribute to improved quality and how pharmacists can influence the characteristics.
Audience: Undergraduate

5. Explain how quality indicators are developed, measured, and monitored in the US healthcare system.
Audience: Undergraduate

6. Describe and apply economic evaluation and pharmacoeconomic principles to evaluate pharmacy programs and drug products.
Audience: Undergraduate

PHARMACY 612 – LEGAL STRUCTURES FOR CONTROLLED SUBSTANCES
1 credit.

Discusses federal statutes and regulations related to drug manufacturing, drug distribution, and drug use, with an emphasis on drug scheduling and controlled substances. Describes the governmental framework within which pharmaceutical development is regulated and practiced. Covers statues and regulations protecting human subjects' privacy and autonomy in research.
Requisites: Declared in MS Pharmaceutical Sciences: Psychoactive Pharmaceutical Investigation or Capstone Certificate in Psychoactive Pharmaceutical Investigation
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Identify and describe the major federal statutes and regulations affecting use of controlled substances
Audience: Graduate

2. Identify potential legal problems in use and handling of controlled substances before they may occur
Audience: Graduate

3. Apply knowledge of the statutes/regulations to various research settings
Audience: Graduate

4. Locate and identify reputable sources of legal information
Audience: Graduate

PHARMACY 621 – PHARMACOKINETICS
3 credits.

Introduction to pharmacokinetics. Fundamental principles and specific physical models are discussed. Absorption, distribution, metabolism, and excretion are thoroughly described including applications to pharmacotherapy mostly through a one body compartment model. Biopharmaceuticals and small molecule drugs are discussed based on their specific pharmacokinetics. All pharmacokinetics and pharmacodynamics principles and concepts are further described in depth in terms of their clinical applications with an emphasis on the role of the pharmacy professional.
Requisites: Declared in the Doctor of Pharmacy program
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Apply the one-compartment pharmacokinetic model as it relates to the IV bolus dose, extravascular dose, constant rate regimens and multiple dose regimens.
Audience: Graduate

2. Describe drug movement through membranes, drug absorption, distribution and elimination.
Audience: Graduate

3. Explain enzyme kinetics, protein binding, and blood flow influences on a drug's pharmacokinetics.
Audience: Graduate

4. Describe integration of drug kinetics with physiology.
Audience: Graduate

5. Discuss drug Pharmacodynamics and its relationship to drug pharmacokinetics.
Audience: Graduate

6. Develop a drug dosing regimen for a medication in a patient with kidney or liver impairment using only the FDA-approved labeling (prescribing information) for a medication.
Audience: Graduate

7. Apply pharmacokinetics and pharmacodynamics to drug regimen modifications based on therapeutic drug monitoring.
Audience: Graduate

PHARMACY 630 – RURAL PHARMACY PRACTICE
2 credits.

Explore how public health intersects with healthcare delivery in rural settings through direct engagement with rural communities, practitioners, and themes in rural practice. Apply therapeutic knowledge to fulfill unmet community needs, and thereby enhance delivery of healthcare in rural communities. Create a pharmacy-driven service with the goal of enhancing healthcare delivery in a rural area based on a community assessment, exploration of contemporary rural health care trends, and discussion with current rural health practitioners.
Requisites: Declared in the Doctor of Pharmacy Program with third year standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Describe the importance of a community-based assessment as a method for exploring community healthcare needs.
Audience: Graduate

2. Explain the essential role that community health departments play in supporting rural communities, as well as the opportunities for pharmacists and community health departments to collaborate in improving healthcare delivery.
Audience: Graduate

3. Identify opportunities to improve rural pharmacy practice through assessment of evidence based resources and literature.
Audience: Graduate

4. Identify challenges in rural healthcare and recommend potential pharmacy practice solutions through dialogue with rural health practitioners and patients.
Audience: Graduate

5. Explore service models and opportunities for interprofessional care in rural communities.
Audience: Graduate

6. Evaluate rural hospital and community pharmacy financial models to identify strategies to remaining financially solvent.
Audience: Graduate

7. Assess pharmacists' leadership opportunities in rural practice and how effective pharmacy leaders can shape the landscape of practice and service opportunities delivered in rural communities.
Audience: Graduate

8. Examine the interplay between public health and epidemiology to design healthcare services to match community needs.
Audience: Graduate

PHARMACY 632 – NEUROSCIENCE OF PSYCHEDELICS
3 credits.

Learn about psychiatric disorders and the profound effects of classical psychedelics on neural processes. Assess current hypotheses on their molecular actions and coupling to cellular, network, and behavioral effects, and how they might translate into therapeutic benefit. Explore the intersection of the actions of these agents with current models of the neural basis of perception, cognition, and consciousness.
Requisites: PSYCH/ZOOLOGY 523, PSYCH/NEURODPT/NTP 611 or PHARMACY 770. Not open to students with credit for NTP 632.
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Describe experimental techniques and measurements used to probe changes in neuronal activity and connectivity and identify the major limitations of each method and propose approaches to overcome those limitations
Audience: Graduate

2. Describe experimental techniques and measurements used to probe changes in neuronal activity and connectivity
Audience: Undergraduate

3. Identify the major known classical psychedelic agents in terms of their chemical structure, targets (receptors, cells, brain areas) in the brain, duration of action, and suitability for administration in a clinical setting
Audience: Undergraduate

4. Identify the major known classical psychedelic agents in terms of their chemical structure, targets (receptors, cells, brain areas) in the brain, duration of action, and suitability for administration in a clinical setting and also summarize the signaling pathways underlying cellular actions of psychedelic agents.
Audience: Graduate

5. Demonstrate knowledge of the cell types and brain areas most likely to mediate distinct behavioral effects of psychedelics, and of the experimental support for these hypotheses.
Audience: Undergraduate

6. Demonstrate knowledge of the cell types and brain areas most likely to mediate distinct behavioral effects of psychedelics, and of the experimental support for these hypotheses, and also demonstrate ability to identify gaps in experimental support for these hypotheses and to design experiments to fill those gaps
Audience: Graduate

7. Identify and summarize the major behavioral assays of the psychedelic experience and of psychiatric disorders (e.g. depression scales).
Audience: Undergraduate

8. Identify and summarize the major behavioral assays of the psychedelic experience and of psychiatric disorders (e.g. depression scales), and also identify and summarize the shortcomings of the major behavioral assays of the psychedelic experience and of psychiatric disorders (e.g. depression scales), and demonstrate ability to propose revisions of those scales to address those shortcomings.
Audience: Graduate

9. Identify and summarize clinical applications of psychedelics, and the theories and factors contributing to their therapeutic benefit
Audience: Undergraduate

PHARMACY 640 – APPROPRIATE USE OF ABUSED DRUGS
2 credits.

Discusses the biological and pharmacological basis of dependence of substances of abuse. Teaches the skills required for best practices in prescribing agents of abuse. Drugs of abuse covered include opioids use for acute and chronic pain, in addition to other abused substances such as cannabinoids, psychedelics, amphetamines and related agents. Students will learn appropriate methods of therapeutic tapering and treatment of withdrawal, as well as the treatment of known and unknown agent overdose. Teaches skills in interpreting and responding to findings of urine drug tests and the prescription drug monitoring database.
Requisites: PHM SCI 521
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Demonstrate knowledge about the neuro- and psycho-pharmacology of substance dependence.
Audience: Undergraduate

2. Define and distinguish between substance use, misuse, abuse and dependence
Audience: Undergraduate

3. Explain the public health implications of substance misuse
Audience: Undergraduate

4. Identify optimal treatment of patients with chronic, malignant pain
Audience: Undergraduate

5. Describe the best practices for initiating opioids therapy for acute and chronic non-malignant pain
Audience: Undergraduate

6. Design pain medication regiments that include the selection of the appropriate opioid, dose, and titration/de-titration plan
Audience: Undergraduate

7. Describe how and why to switch from one opioid to another
Audience: Undergraduate

8. Develop a medication plan for the management of opioid use disorder in a patient
Audience: Undergraduate

9. Interpret urine drug tests and the Prescription Drug Monitoring Program, and create patient treatment plans based upon these findings
Audience: Undergraduate

10. Understand pharmacology, appropriate use and misuse of CNS stimulants and CNS depressants
Audience: Undergraduate

11. Identify the symptoms of toxicity from overdoses of abused drugs.
Audience: Undergraduate

12. Manage patients admitted with toxicity from overdoses of abused drugs.
Audience: Undergraduate

13. Anticipate the agents of misuse in specific populations as athletes and students.
Audience: Undergraduate

14. Describe alternative, opioid-sparing strategies for treating acute and chronic pain.
Audience: Undergraduate

PHARMACY 645 – PHARMACEUTICAL BIOTECHNOLOGY AND PHARMACOGENOMICS
2-3 credits.

Facilitates the understanding and application of the principles of pharmaceutical biotechnology and pharmacogenomics. The third, optional, elective credit, open only to Pharm.D. students, will consist of clinical case studies in biotechnology and pharmacogenomics, to apply theory to clinical pharmacy practice.
Requisites: PHM SCI 432 and Declared in the Doctor of Pharmacy program with third year standing
Repeatable for Credit: No
Last Taught: Fall 2023

PHARMACY 658 – SPECIALTY PHARMACY IN A MODERN HEALTHCARE SETTING
2 credits.

Introduction to specialty pharmacy, a growing and important segment of the pharmaceutical marketplace. Importance of economic, business and management principles to develop, implement and evaluate specialty pharmacy services within health systems. Modern health system cases about implementation of specialty pharmacy services in clinic and in pharmacy departments to improve patient outcomes from specialty medications and increase volume of specialty medications dispensed.
Requisites: Declared in Doctor of Pharmacy program with third year standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Describe the core fundamentals of specialty pharmacy including economics, market trends, contracting, and specialty pharmaceutical reimbursement
Audience: Graduate

2. Analyze data demonstrating the impact that specialty pharmacy has on health systems and patient outcomes
Audience: Graduate

3. Analyze case studies of specialty pharmacy topics in modern health care systems
Audience: Graduate

4. Describe current specialty pharmacy accreditation regulations and the application for accreditation status process
Audience: Graduate

5. Describe and analyze the process related to starting a specialty pharmacy program within a health system and the associated considerations
Audience: Graduate

PHARMACY 671 – PSYCHEDELIC DRUGS IN SCIENCE AND SOCIETY
2 credits.

Overview of the science behind therapeutic use of psychedelic drugs such as psilocybin and LSD; basic medicinal chemistry of the tryptamine and phenethylamine psychedelics, as well as the neurochemistry and neuropharmacology of their action. Fundamentals of drug development and FDA approval process; Standards of screening and guiding individuals before and during a therapeutic psychedelic session contrasted with the recreational use of these drugs; Appraisal of current clinical research including an objective analysis of risk/benefit for indications such as depression and addiction. History of traditional, ceremonial use of psychedelics, as well as the relationship between recreational use and attempts to regulate and restrict their use. Role of psychedelics in indigenous cultures, impacts of psychedelic tourism and wild-crafting of plants and animals on indigenous peoples. Contrasts in psychedelic treatments to other therapeutic interventions such as mindfulness and meditation.
Requisites: Declared in MS Pharmaceutical Sciences: Psychoactive Pharmaceutical Investigation or Capstone Certificate in Psychoactive Pharmaceutical Investigation
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Describe the roles of psychedelic compounds in the traditional rituals of indigenous peoples, and the impact of psychedelic tourism upon these native societies and their environment.
Audience: Graduate

2. Describe the history and rationale for the regulation and prohibition of these compounds in the past century.
Audience: Graduate

3. Describe the similarities between efforts to decriminalize cannabis and psychedelics, including pros and cons for each position.
Audience: Graduate

4. Describe the path by which psychedelic drugs may be proposed to the FDA for approval drugs, and rescheduled by the DEA.
Audience: Graduate

5. Identify the basic chemical structures of the most common psychedelic tryptamines and phenethylamines, and their usual pharmacologic targets in the brain.
Audience: Graduate

6. Describe and critique examples of the research literature on the human use of psilocybin and LSD for the treatment of diseases such as depression and substance abuse disorders, including proposed metrics of effect.
Audience: Graduate

7. Describe the usual screening, preparation, and care of a subject receiving psilocybin, and the expected skills, training, and role of the attending clinicians.
Audience: Graduate

8. Describe the relationship of psychedelic treatment to other methods of care such as meditation, mindfulness, and cognitive behavioral therapy.
Audience: Graduate

PHARMACY 674 – CANNABINOIDS IN SCIENCE AND SOCIETY
2 credits.

Provides an overview of the history, botany, and legal policies of cannabis and examines cannabinoid pharmacology and the most common therapeutic applications. Assessment of cannabinoid therapy with an emphasis on evaluating the risks and benefits of cannabinoid therapy for these conditions, product and dose regimen selection, monitoring and titration.
Requisites: Graduate/professional standing or declared in Pyschoactive Pharmaceutical Investigation Capstone Certificate
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Describe the role of the endocannabinoid system in human disease.
Audience: Graduate

2. Identify appropriate cannabinoid use in various disease states.
Audience: Graduate

3. Describe the mechanism of action of THC and CBD on several body systems and disease states.
Audience: Graduate

4. Explain the pharmacology of THC and CBD.
Audience: Graduate

5. Describe common / serious drug interactions and adverse effects of cannabis therapies and methods for preventing or minimizing their occurrence.
Audience: Graduate

6. Analyze and present primary and lay literature regarding cannabinoid therapy.
Audience: Graduate

PHARMACY/NURSING/PHY ASST/PHY THER/PUBLHLTH 758 – INTERPROFESSIONAL PUBLIC HEALTH LEADERSHIP
1 credit.

Build skills in collaboration, problem solving, and reflection to approach complex community-based public health problems contribute to becoming a public leader. Explore the six levels of public health leadership through the practices of current and past public health leaders, case studies, and personal experience.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2019
Learning Outcomes: 1. Describe the roles and responsibilities of their profession with all participating health professional students, while examining the roles and responsibilities of all other health professions.
Audience: Graduate

2. Compare and contrast the diversity of expertise among participating health professions.
Audience: Graduate

3. Apply their profession's roles and responsibilities to case studies that address complex public health issues.
Audience: Graduate

4. Describe what it means to be part of an interprofessional team and illustrate how the different professions and systems can complement and facilitate one another in addressing public health issues.
Audience: Graduate

5. Apply the principles of public health leadership via reflective exercises, case studies and facilitated discussion.
Audience: Graduate

6. Promote a public health cause or principle through legislative advocacy.

Audience: Graduate

7. Elucidate the importance of reflection as a life-long learning and leadership tool.
Audience: Graduate

PHARMACY 770 – CNS DRUG DESIGNS, ACTIONS, AND APPLICATIONS I
2 credits.

Provides a foundational understanding of how chemical features can influence the biological activity of a molecule on molecular targets within the central nervous system (CNS), how alteration of signaling through these targets occurs and leads to physiologically relevant changes, and how major classes of pharmaceuticals acting on the central nervous system are applied in healthcare settings to improve patient outcomes. Integration between concepts arising at the chemical, molecular, cellular, systems, organism, and societal levels will be explored.
Requisites: Declared in MS Pharmaceutical Sciences
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023
Learning Outcomes: 1. Identify CNS active drug classes and origins of cholinergic and glutamatergic drugs based in part on structural aspects of the molecule
Audience: Graduate

2. List physicochemical properties of drugs that influence their ability to access the CNS
Audience: Graduate

3. Recall anatomical structures and molecular machinery that influences drug access to and efflux from the CNS
Audience: Graduate

4. Describe the major neurotransmitters of the central nervous system, including their physiologic role, distribution, synthesis, storage, and release

Audience: Graduate

5. Recall the principal mechanisms by which receptors affect cellular signaling in the Central Nervous System
Audience: Graduate

6. Compare and contrast the actions of psychoactive pharmaceuticals on cholinergic and glutamatergic signaling within the Central Nervous System

Audience: Graduate

7. Recognize the psychiatric conditions and target symptoms of these conditions that are commonly treated with cholingergic and glutamateric pharmaceuticals
Audience: Graduate

8. Explain how the use of cholinergic and gluatamatergic pharmaceuticals fits in with other non-pharmacologic approaches to clinical care for psychiatric conditions
Audience: Graduate

9. Describe common / serious adverse effects of cholinergic and glutamatergic pharmaceuticals and methods for preventing or minimizing their occurrence
Audience: Graduate

10. Match cholinergic and glutamatergic pharmaceutical agents to the psychiatric conditions they are commonly used to treat
Audience: Graduate

PHARMACY 771 – CNS DRUG DESIGNS, ACTIONS, AND APPLICATIONS II
2 credits.

Gain additional understanding of how chemical features can influence the biological activity of a molecule on molecular targets within the central nervous system, how alteration of signaling through these targets occurs and leads to physiologically relevant changes, and how major classes of pharmaceuticals acting on the central nervous system are applied in healthcare settings to improve patient outcomes. Integration between concepts arising at the chemical, molecular, cellular, systems, organism, and societal levels will be explored.
Requisites: PHARMACY 770
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Identify GABAergic, adrenergic, dopaminergic, serotonergic, and opioid drug classes and drug origins based in part on structural aspects of the molecule
Audience: Graduate

2. Compare and contrast the actions of GABAergic, adrenergic, dopaminergic, serotonergic, and opioid pharmaceuticals on chemical and electrical signaling within the Central Nervous System
Audience: Graduate

3. Recognize the psychiatric conditions and target symptoms of these conditions that are commonly treated with GABAergic, adrenergic, dopaminergic, serotonergic, and opioid pharmaceuticals
Audience: Graduate

4. Describe common / serious adverse effects of GABAergic, adrenergic, dopaminergic, serotonergic, and opioid pharmaceuticals and methods for preventing or minimizing their occurrence
Audience: Graduate

5. Match GABAergic, adrenergic, dopaminergic, serotonergic, and opioid pharmaceutical agents to the psychiatric conditions they are commonly used to treat
Audience: Graduate

6. Assess challenges to development and use of psychoactive pharmaceuticals that are either shared across major neurotransmitter systems or unique to specific classes of drugs
Audience: Graduate

PHARMACY 800 – RESEARCH ETHICS: SCIENTIFIC INTEGRITY AND THE RESPONSIBLE CONDUCT OF RESEARCH
2 credits.

Familiarizes graduate students with basic ethical issues associated with biomedical science research, taught via a case study approach. Content structured to meet NIH and NSF requirements for Responsible Conduct of Research (RCR) training. Students declared in the Pharmacology and Toxicology undergraduate program may enroll via consent of instructor.
Requisites: Declared in the Pharmaceutical Sciences PhD, Social and Administrative Sciences in Pharmacy PhD, or in the Pharmacy Master's program
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2023
Learning Outcomes: . Identify, analyze, and explain basic ethical issues and the responsible conduct of biomedical clinical and translational research on topics including but not limited to NIH mandated subjects
Audience: Graduate

. Communicate knowledge about ethical principles in scientific research effectively to a range of audiences
Audience: Graduate

PHARMACY 801 – BIOETHICS AND SCIENTIFIC INTEGRITY
2 credits.

Explores basic ethical issues associated with biomedical science research, particularly as pertains to the development of drugs and emergent pharmaceutical therapies, such as psychoactive-assisted therapies.
Requisites: Declared in MS Pharmaceutical Sciences: Psychoactive Pharmaceutical Investigation or Capstone Certificate in Psychoactive Pharmaceutical Investigation
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024
Learning Outcomes: 1. Describe elements of proper scientific conduct and the institutional oversight that regulates scientific conduct
Audience: Graduate

2. Explain how socially responsible scientific practices can be used in scientific and medical research, scientific communication, and intellectual property
Audience: Graduate

3. Identify best practices for clinical research and the necessary elements to ensure patient safety, reliable data, and public benefit
Audience: Graduate

4. Define the different types of intellectual property and how it can both enable and stifle innovation
Audience: Graduate

5. Explain the elements of misconduct in scientific literature and publishing. Give examples of how this misconduct causes harm to both scientific reputations and public health
Audience: Graduate

6. Critique peer reviewed research from the psychedelic field using the ethical issues named in the above outcomes
Audience: Graduate