straighterline

Syllabus

PHARM103 | **Pharmacology**

Course Text

Hitner, Henry, et al. *Pharmacology: An Introduction*. 8th ed., McGraw-Hill Education, 2025.

This text is provided digitally as part of the course enrollment.

Course Description

This undergraduate pharmacology course introduces students to the fundamental principles of drug action and their clinical applications across a wide range of human physiological systems. Emphasizing core concepts such as pharmacokinetics, pharmacodynamics, mechanisms of action, therapeutic indications, and side effect profiles, the course bridges basic science with practical clinical relevance. Learning is supported through instructional videos, interactive modules, and case-based activities that encourage critical thinking and application. By the end of the course, students will have a strong foundation in pharmacological reasoning, preparing them for advanced study or careers in healthcare and biomedical sciences.

Learning Outcomes

After completing this course, students will be able to:

1. Explain how pharmacokinetic principles influence drug selection and dosing, in general, pediatric, and geriatric populations.
2. Apply mathematical and critical reasoning skills to calculate accurate medication dosages, titrations, and infusion rates.
3. Compare the mechanisms of action, therapeutic uses, and side effect profiles of drugs which impact the major organ systems.
4. Evaluate how physiological and pathophysiologic changes in major organ systems affect drug metabolism, efficacy, safety, and monitoring requirements.
5. Differentiate drug classes within major therapeutic categories (e.g., antihypertensives, diuretics, anticoagulants, bronchodilators), and justify their use based on disease mechanisms and patient-specific factors.
6. Interpret how genetics, comorbidities, and concurrent medications contribute to individual variation in drug response and adverse effects.
7. Integrate knowledge of physiology, drug action, side effects, and patient characteristics to propose evidence-based pharmacologic interventions for common clinical conditions.

Course Prerequisites

There are no prerequisites for this course.

Academic Integrity Statement

Academic integrity is the pursuit of scholarly activity in an honest, truthful and responsible manner. Violations of academic integrity include, but are not limited to, plagiarism, cheating, fabrication and academic misconduct. Failure to comply with the Academic Integrity Policy can result in a failure and/or zero on the attempted assignment/examination, a removal from the course, disqualification to enroll in future courses, and/or revocation of an academic transcript.

Course Completion Policy

In order for a course to be considered complete, **all required coursework must be attempted, submitted, and graded.** Required coursework consists of graded assignments. Any Academic Integrity Policy violations may prevent a course from being considered complete.

Assessment Types

StraighterLine courses may include any combination of the assessment types described below. Review the descriptions to learn about each type, then review the Course Evaluation Criteria to understand how your learning will be measured in this course.

Benchmarks
Benchmarks test your mastery of course concepts. You have 3 attempts, and your highest score counts.
Note: Cumulative Benchmarks (final exams) only allow 1 attempt.

Capstones
Capstones are project-based assessments that help you apply concepts to real-world scenarios. You have 2 attempts, and your highest score counts.

Checkpoints
Checkpoints are quick knowledge checks on important course concepts. All are open-book, and most have 1-3 attempts.

Course Evaluation Criteria

Your score provides a percentage score and letter grade for each course. A passing percentage is 70% or higher.

There are a total of 1000 points in the course:

Assessment	Points	Learning Outcomes
Checkpoint 1: Introduction to Pharmacokinetics	5	1

Assessment	Points	Learning Outcomes
Checkpoint 2: Math Review and Dosage Calculations	5	2
Checkpoint 3: Pharmacology of the Peripheral Nervous System I	5	3-7
Checkpoint 4: Pharmacology of the Peripheral Nervous System II	5	3-7
Benchmark 1: Checkpoints 1-4	125	1-7
Checkpoint 5: Renal Systems and Vascular Pharmacology	5	3-7
Checkpoint 6: Vascular Nutrition, and Hematologic Pharmacology	5	3-7
Checkpoint 7: Pharmacology of the Heart	5	3-7
Checkpoint 8: Respiratory System Pharmacology	5	3-7
Benchmark 2: Checkpoints 5-8	125	3-7
Capstone 1: Pharmacology in Contrast: Exploring Mechanisms, Pathways, and Side Effects	200	1, 3-7
Checkpoint 9: Gastrointestinal Pharmacology	5	3-7
Checkpoint 10: Pharmacology of the Central Nervous System I	5	3-7
Checkpoint 11: Pharmacology of the Central Nervous System II	5	3-7
Checkpoint 12: Pharmacology of Pain Management	5	3-7
Benchmark 3: Checkpoints 9-12	125	1, 3-7
Checkpoint 13: Pharmacology of the Endocrine System I	5	3-7
Checkpoint 14: Pharmacology of the Endocrine System II	5	3-7
Checkpoint 15: Pharmacology of Infectious Diseases I	5	3-7
Checkpoint 16: Pharmacology of Infectious Diseases II	5	3-7
Checkpoint 17: Antineoplastics and Drugs Affecting the Immune System	5	3-7
Benchmark 4: Checkpoints 13-17	125	3-7
Capstone 2: Clinical Pharmacology in Action	215	1, 3-7
Total	**1000**	

Course Roadmap

This roadmap provides an overview of the checkpoints and lessons covered in this course.

Checkpoint 1: Introduction to Pharmacokinetics

- Introduction
- Pharmacokinetics and Factors of Individual Variation

- Geriatric Pharmacology

Checkpoint 2: Math Review and Dosage Calculations

- Math Review and Dosage Calculations

Checkpoint 3: Pharmacology of the Peripheral Nervous System I

- Introduction to the Autonomic Nervous System
- Drugs Affecting the Sympathetic Nervous System
- Drugs Affecting the Parasympathetic Nervous System

Checkpoint 4: Pharmacology of the Peripheral Nervous System II

- Drugs Affecting the Autonomic Ganglia
- Skeletal Muscle Relaxants
- Local Anesthetics

Checkpoint 5: Renal Systems and Vascular Pharmacology

- Diuretics
- Antihypertensive Drugs

Checkpoint 6: Vascular Nutrition, and Hematologic Pharmacology

- Anticoagulants and Coagulants
- Nutrition and Therapy
- Hypolipidemic Drugs
- Hematinics

Checkpoint 7: Pharmacology of the Heart

- Review of Cardiac Physiology and Pathology
- Treatment of Heart Failure
- Antiarrhythmic Drugs
- Antianginal Drugs

Checkpoint 8: Respiratory System Pharmacology

- Antihistamines and Mast Cell Stabilizers
- Respiratory Pharmacology, Treatment of Asthma and COPD

Checkpoint 9: Gastrointestinal Pharmacology

- Therapy of GI Disorders: Peptic Ulcers, GERD, and Vomiting
- Agents that Affect Intestinal Motility

Checkpoint 10: Pharmacology of the Central Nervous System I

- Introduction to the Central Nervous System
- Sedative-Hypnotic Drugs and Alcohol
- Antipsychotic and Antianxiety Drugs

- Antidepressants, Psychomotor Stimulants, and Lithium
- Psychotomimetic Drugs of Abuse

Checkpoint 11: Pharmacology of the Central Nervous System II

- Antiepileptic Drugs
- Antiparkinson Drugs and Alzheimer's Disease Drugs
- General Anesthetics

Checkpoint 12: Pharmacology of Pain Management

- Opioid Analgesics
- Nonopioid Analgesics, Nonsteroidal Anti-Inflammatories, and Antigout Drugs

Checkpoint 13: Pharmacology of the Endocrine System I

- Introduction to the Endocrine System
- Adrenal Steroids
- Gonadal Hormones, Oral Contraceptives, and Erectile Dysfunction Drugs

Checkpoint 14: Pharmacology of the Endocrine System II

- Drugs Affecting the Thyroid and Parathyroid Glands and Bone Degeneration
- Pancreatic Hormones and Antidiabetic Drugs
- Posterior Pituitary Hormones: Antidiuretic Hormone and Oxytocin

Checkpoint 15: Pharmacology of Infectious Diseases I

- Antibacterial Agents
- Antifungal and Antiviral Drugs

Checkpoint 16: Pharmacology of Infectious Diseases II

- Parasitic Infections: Antiprotozoal and Anthelmintic Drugs
- Antiseptics and Disinfectants

Checkpoint 17: Antineoplastics and Drugs Affecting the Immune System

- Antineoplastic Agents and Oncology Immunotherapy
- Immunopharmacology

Related Courses

NUTRI101
Introduction to Nutrition

BIO201
Anatomy and Physiology I

BIO201L
Anatomy and Physiology I Lab

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