

Pharmacology I

Course Text

- Hitner, Henry and Barbara Nagle. Pharmacology: An Introduction, 6th edition, McGraw-Hill, 2011. ISBN: 9780073520865 [This text is available as an etextbook at purchase or students may find used, new, or rental copies at [this link](#)]

Course Description

This course introduces pharmacology as the study of drugs. The course begins with an explanation of therapeutic and adverse effects, in addition to the basic operation of the nervous system. Then, several body systems and the conditions that affect them are reviewed, with particular reference to the use of drugs to treat these conditions. Topics include muscle relaxants, anesthetics, pain medication, and nervous system and psychological disorders. As students work through this course, their appreciation of how drugs affect the body in intended and unintended ways will increase.

Course Objectives

After completing this course, students will be able to:

- Relate drug terminology to their appropriate definitions, and analyze aspects of drug actions, effects, and responses.
- Evaluate individual variation factors to drug responses, and explain drug interaction, dependence, and abuse.
- Solve dosage calculation problems involving fractions, decimals, percents, ratios, proportions and using the metric, apothecary, and household measurement systems.
- Evaluate the contribution of nutrients towards maintaining normal body function, and explain nutrition deficiency, drug and supplement interaction, and effects of supplement overdose.
- Describe brain structure and functioning, and explain how various parts of the brain regulate organ function.
- Examine the functioning of the autonomic nervous system and the stimulation of the parasympathetic nervous system.
- Evaluate how drugs increase or reduce the sympathetic, parasympathetic, and autonomic nervous system activities.
- Explain how muscle relaxants act on the body and assess their effects and adverse effects.
- Compare and contrast general and local anesthetics with reference to their routes of administration, mechanisms of action, effects, and adverse effects.
- Evaluate the contribution of opioid analgesics towards pain alleviation, and assess their effects and adverse effects.
- Assess the types of nonopioid analgesics and their dosages, and relate the effects of these drugs to the treatment of inflammation and gout.
- List types of epilepsy and symptoms and causes of Parkinson's disease, and explain the actions and adverse effects of drugs used to treat these disorders.
- Analyze the various types of mental disorders and evaluate the effects of antipsychotic, antianxiety, antidepressant, and antimanic drugs.

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- Analyze the mechanisms of hypnotic and psychotomimetic drug action, compare and contrast the effects of barbiturates and benzodiazepines, and examine the potential abuse of psychotomimetic drugs.
- List types of epilepsy and symptoms and causes of Parkinson's disease, and explain the actions and adverse effects of drugs used to treat these disorders.

Course Prerequisites

There are no prerequisites for this course.

Important Terms

In this course, different terms are used to designate tasks:

- Proctoring: all final exams require proctoring which can be completed conveniently from your home. A webcam is required.
- Tutoring: memberships include online tutoring for students to access with any content/subject related questions in the place of faculty. If your tutor is not able to answer your questions please contact a student advisor.
- Practice Exercise: A non-graded assignment to assist you in practicing the skills discussed in a topic.
- Exam: A graded online test.

Course Evaluation Criteria

StraighterLine provides a percentage score and letter grade for each course. See [Academic Questions](#) section in FAQ for further details on percentage scores and grading scale. A passing percentage is **70%** or higher.

If you have chosen a Partner College to award credit for this course, your final grade will be based upon that college's grading scale. Only passing scores will be considered by Partner Colleges for an award of credit.

There are a total of 1000 points in the course.

Topic	Assessment	Points Available
3	Graded Exam #1	125
7	Graded Exam #2	125
7	Midterm Exam	250
11	Graded Exam #3	125
14	Graded Exam #4	125
15	Final Graded Exam	250
Total		1000

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Course Topics and Objectives

Topic	Title	Subtopics	Objectives
1	Basics of Pharmacology	<ul style="list-style-type: none"> • Drug Terminology • Drug Effects • Drug Actions • Drug Response 	<ul style="list-style-type: none"> • Relate the basic drug terminology used in pharmacology to its appropriate definition. • Analyze the effects that a drug can produce in the body with specific reference to therapeutic effect, side effect, and toxic effect. • Evaluate what happens when a drug is ingested into the human body with reference to the processes of drug absorption, distribution, metabolism, and excretion. • Analyze the response of a drug in the human body with reference to half-life, blood drug levels, and bioavailability.
2	Factors Affecting Drug Actions	<ul style="list-style-type: none"> • Individual Variability and Drug Interaction • Drug Dependence and Abuse • Pediatric Pharmacology • Geriatric Pharmacology 	<ul style="list-style-type: none"> • Analyze the factors that influence drug response in individuals and explain how individual variability is different from drug interaction. • Distinguish between drug dependence and abuse with respect to the reasons for taking the drug. • Evaluate drug actions in pediatric patients and propose appropriate drug administration methods. • Evaluate drug actions in elderly patients and propose appropriate drug administration methods.
3	Dosage Calculations	<ul style="list-style-type: none"> • Fractions, Decimals, and Percents • Systems of Measurements • Ratios and Proportions • Solutions and IV 	<ul style="list-style-type: none"> • Solve problems using fractions, decimals, and percents. • Solve dosage calculation problems using metric, apothecary, and household systems of measurement. • Solve dosage calculation problems using ratios and proportions. • Solve dosage calculation problems for solutions and intravenous infusions.

4	Autonomic Nervous System	<ul style="list-style-type: none"> • Autonomic Nervous System Functioning • Parasympathetic Stimulation 	<ul style="list-style-type: none"> • Illustrate the functions of the autonomic nervous system, including the role of neurotransmitters. • Examine the effects of parasympathetic stimulation.
5	Muscle Relaxants	<ul style="list-style-type: none"> • Muscle Activity • Muscle Relaxants 	<ul style="list-style-type: none"> • Describe the process of muscle relaxation and contraction. • Distinguish among the various types of muscle relaxants with reference to their mechanism of action, route of administration, clinical indications, and effects. • Relate the various types of muscle relaxants to their adverse effects and drug interactions.
6	Anesthetics	<ul style="list-style-type: none"> • General Anesthetics • Local Anesthetics • Administration • Excretion • Side Effects and Adverse Effects 	<ul style="list-style-type: none"> • Sequence the stages of general anesthesia with specific reference to the action of drug adjuncts. • Analyze the mechanism of action of local anesthetics and their effect on the heart. • Compare and contrast the routes of administration for various general and local anesthetics. • Compare and contrast the ways in which general and local anesthetics are excreted from the body. • Compare and contrast the side effects and adverse effects of general and local anesthetics.
7	Central Nervous System	<ul style="list-style-type: none"> • Central Nervous System Structure • Organ Function 	<ul style="list-style-type: none"> • Examine the structure of the human brain and explain the functions of its various parts. • Evaluate the role of the brain's various parts in regulating organ functions.
8	Sedative-Hypnotic and Psychotomimetic Drugs	<ul style="list-style-type: none"> • Sedative-Hypnotic Drugs • Psychotomimetic Drugs 	<ul style="list-style-type: none"> • Analyze the role of hypnotic drugs in relation to the sleep cycle and describe their adverse effects. • Analyze the mechanisms of action of various psychotomimetic drugs. • Compare and contrast barbiturates and benzodiazepines in terms of their mechanisms of action, pharmacokinetics, adverse effects,

			<p>contraindications, and drug interactions.</p> <ul style="list-style-type: none"> • Compare various psychotomimetic drugs with reference to their tolerance and dependency and treatment for intoxication.
9	Psychological Disorders	<ul style="list-style-type: none"> • Mental Disorders • Antipsychotic Drugs • Antianxiety Drugs • Antidepressants • Antimanic Drugs 	<ul style="list-style-type: none"> • Compare and contrast the various antipsychotic drugs in terms of their effects and adverse effects. • Distinguish among the various antianxiety drugs in terms of their mechanisms of action, effects, and adverse effects. • Evaluate the similarities and differences between the major antidepressant drugs, including psychomotor stimulants, with reference to their mechanisms of action, effects, relevant dietary restrictions, and adverse effects. • Examine the mechanisms of action, effects, and adverse effects of lithium as an antimanic drug. • Classify mental disorders as psychoses, neuroses, and mood disorders
10	Nervous System Drugs	<ul style="list-style-type: none"> • Effects of Drugs on the Sympathetic Nervous System • Effects of Drugs on the Parasympathetic Nervous System • Effects of Drugs on the Autonomic Ganglia 	<ul style="list-style-type: none"> • Evaluate the role of norepinephrine and epinephrine on alpha- and beta-adrenergic receptors. • Analyze how drugs act to reduce sympathetic activity. • Assess the role of acetylcholine on the parasympathetic nervous system. • Distinguish between drugs that produce ganglionic stimulation and ganglionic blockade with respect to their effects and adverse effects. • Analyze how drugs act to reduce parasympathetic activity.
11	Nervous System Disorders	<ul style="list-style-type: none"> • Epilepsy • Parkinson's Disease 	<ul style="list-style-type: none"> • Evaluate the characteristics of various types of epilepsy with reference to generalized or partial seizures. • List the symptoms of Parkinson's disease and evaluate its causes. • Select the correct drugs to treat

			<p>epilepsy in terms of their mechanisms of action and adverse effects.</p> <ul style="list-style-type: none"> • Select appropriate drugs to treat Parkinson's disease based on drug actions, interactions, and adverse effects.
12	Opioid Analgesics	<ul style="list-style-type: none"> • Effects of Opioid Analgesics • Other Effects of Opioid Analgesics • Adverse Effects and Drug Interactions 	<ul style="list-style-type: none"> • List the sources of opioid analgesics and relate their effects to the physiology of pain. • Examine the actions of opioid analgesics as antitussives on the smooth muscles, cardiovascular system, and eyes. • Explain the mechanism of action of opioid analgesics. • Analyze the most common adverse effects and drug interactions of opioid analgesics and explain opioid poisoning and opioid antagonists.
13	Nonopioid Drugs for Pain, Inflammation, and Gout	<ul style="list-style-type: none"> • Nonopioid Analgesics • Inflammation • Gout 	<ul style="list-style-type: none"> • Evaluate the various types of nonopioid analgesics and recommend correct doses of these drugs for adults. • Explain the absorption, metabolism, and adverse effects of nonopioid analgesics. • Select appropriate pain relief drugs for various types of inflammation. • Assess the treatment of acute gout with relation to the characteristics of the disease, drug actions, and drug interactions.
14	Nutrition and Fluids	<ul style="list-style-type: none"> • Nutrients • Deficiency • Adverse Effects 	<ul style="list-style-type: none"> • Differentiate the functions of various nutrients in maintaining normal body function. • Analyze nutrient deficiency with relation to recommended levels of nutrients and symptoms of deficiency. • Analyze the effects of supplement overdose and drug-supplement interactions. • Propose treatment plans for deficiency diseases.
15	Review	<ul style="list-style-type: none"> • Review 	<ul style="list-style-type: none"> • Complete a review of key content

			covered in this course and Final Examination.
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