

PHT 55A: PHARMACOLOGY A

Foothill College Course Outline of Record

| Heading | Value |
|-------------------------|---|
| Effective Term: | Summer 2021 |
| Units: | 3 |
| Hours: | 3 lecture per week (36 total per quarter) |
| Prerequisite: | BIOL 14 or equivalent. |
| Degree & Credit Status: | Degree-Applicable Credit Course |
| Foothill GE: | Non-GE |
| Transferable: | CSU |
| Grade Type: | Letter Grade Only |
| Repeatability: | Not Repeatable |

Student Learning Outcomes

- Describe the basic anatomy and physiology of the nervous, endocrine, digestive, urinary, and reproductive systems.
- Identify common pathophysiology of the nervous, endocrine, digestive, urinary and reproductive systems and the prescription and non-prescription remedies, problems and dosages of the treatments.

Description

Introduction to the general principals of pharmacology, with a focus on the anatomy, physiology and application of pharmacological principles pertaining to the nervous, endocrine, exocrine, skeletal, muscle, and reproductive systems. Drugs are discussed related to their mechanism of action, indications, adverse effects, contraindications, precautions and drug interactions. Intended for students in the Pharmacy Technician Program; enrollment is limited to students accepted in the program.

Course Objectives

The student will be able to:

- Explain the components of drug product development relating to prescription, non-prescription, investigational and off-label drugs.
- Describe the naming systems of drugs and drug sources, and the various dosage formulations.
- Explain basic pharmacological principles of pharmacodynamics, pharmacokinetics, pharmacotherapeutics, pharmaceutics, pharmacy, posology, and toxicology.
- Describe the basic anatomy and physiology, pathology and disease states of the nervous system and explain all components of pharmacology of their most commonly prescribed medications, including dose, side effects, adverse effects, monitoring, contraindications, and interactions.
- Describe the basic anatomy and physiology, pathology and disease states of the endocrine system and explain all components of pharmacology of their most commonly prescribed medications, including dose, side effects, adverse effects, monitoring, contraindications, and interactions.
- Describe the basic anatomy and physiology, pathology and disease states of the exocrine system and explain all components of pharmacology of their most commonly prescribed medications, including dose, side effects, adverse effects, monitoring, contraindications, and interactions.
- Describe the basic anatomy and physiology, pathology and disease states of the skeletal-muscular system and explain all components of

pharmacology of their most commonly prescribed medications, including dose, side effects, adverse effects, monitoring, contraindications, and interactions.

H. Describe the basic anatomy and physiology, pathology and disease states of the reproductive system and explain all components of pharmacology of their most commonly prescribed medications, including dose, side effects, adverse effects, monitoring, contraindications, and interactions.

I. Recall and identify the pharmacological components of the top 100 most commonly prescribed drugs.

Course Content

- Introduction to drugs and drug development
 - Drug product development
 - Drug product removal
 - Prescription and nonprescription drugs
 - Controlled substances
- Drug nomenclature, drug sources, and dosage formulations
 - Drug names and naming systems
 - Drug sources
 - Plant, animal, mineral, synthetic, engineered sources
 - Dosage forms of drugs
 - Solid, semisolid, liquid, gaseous drugs
- Basic pharmacological principles
 - Pharmacodynamics
 - Pharmacokinetics
 - Drug absorption
 - Drug distribution
 - Drug metabolism
 - Drug excretion
 - Pharmacotherapeutics
 - Pharmaceutics
 - Pharmacy
 - Posology
 - Drug therapy for specific patient populations
 - Geriatric patients
 - Pediatric patients
 - Pregnant patients
 - Toxicology
 - Side effects and adverse effects of drugs
 - Hypersensitivity or allergy
 - Anaphylactic reaction
- The nervous system
 - Organization
 - Overview of the ANS and PNS
 - Parasympathetic and sympathetic divisions
 - Cholinergic and adrenergic nerve structure and receptors
 - Pharmacology of the peripheral nervous system
 - Alpha adrenergic drugs
 - Alpha adrenergic blocking drugs
 - Beta adrenergic drugs
 - Beta adrenergic blocking drugs
 - Adrenergic neuronal blocking drugs
 - Drugs affecting the parasympathetic nervous system
 - Cholinergic nerve activity and receptors
 - Cholinergic drugs
 - Clinical indications for anticholinesterase drugs
 - Anticholinergic drugs
 - Drugs affecting the autonomic ganglia
 - Ganglionic stimulants
 - Ganglionic blockers

- c. Adverse effects of ganglionic blockers
 - 5. Skeletal muscle relaxants
 - a. Clinical indications
 - b. Peripherally acting skeletal muscle relaxants
 - c. Direct acting skeletal muscle relaxants
 - d. Centrally acting skeletal muscle relaxants
 - 6. Local anesthetics
 - a. MOA
 - b. Routes of administrations
 - c. Clinical applications and preferred treatment
 - 7. Anatomy of the central nervous system
 - a. Structural and functional features of the brain
 - 1) Diencephalon and brainstem
 - 2) Cerebellum
 - 3) Spinal cord
 - 4) Functional components
 - 8. Pharmacology of the central nervous system
 - a. Drugs affecting the central nervous system
 - 1) Sedative-hypnotic drugs
 - a) Sleep cycle
 - b) Effects of alcohol
 - c) Barbiturate sedatives and hypnotics
 - d) Benzodiazepines
 - e) Miscellaneous non-barbiturates
 - f) Alcohol
 - 2) Antipsychotic and anti-anxiety drugs
 - a) Various types of mental disorders
 - b) Antipsychotic drugs
 - c) Anti-anxiety drugs
 - 3) Antidepressants, psychomotor stimulants and lithium
 - a) Types of depression
 - b) Drugs used to treat depression
 - c) Preferred drug therapy for mania and bipolar disorder
 - 4) Psychotomimetic drugs of abuse
 - a) LSD-type hallucinogens
 - b) Psychomotor stimulants
 - c) Miscellaneous psychotomimetic drugs
 - 5) Antiepileptic drugs
 - a) Types of epilepsy
 - b) Drug treatment for partial seizures
 - c) Drug treatment for generalized seizures
 - d) Drug treatment for status epilepticus
 - 6) Antiparkinson drugs
 - a) Neurotransmitters affecting the basal ganglia
 - b) Actions of levodopa
 - c) Dopamine receptor agonist
 - d) Enzyme inhibitors to increase actions of levodopa
 - e) Miscellaneous drugs
 - 7) Alzheimer's disease
 - a) Pharmacotherapy for Alzheimer's disease
 - b. Anesthetics and pain medications
 - 1) General anesthetics
 - a) Physiological stages of anesthesia
 - b) General anesthesia MOA
 - c) Adjuncts to general anesthesia
 - d) Special considerations and cautions
 - e) Preferred use of anesthesia
 - 2) Opioid analgesics
 - a) Pain receptors
 - b) MOA of opioids
 - c) Opioid analgesics
 - d) Opioid antagonists and respiratory depression
 - e) Opioid antitussives
 - f) Drug interactions
- 3) Non-opioid analgesics, NSAIDs and other drugs
 - a) Inflammation
 - b) MOA of anti-inflammatory drugs
 - c) NSAIDs
 - d) Salicylates
 - e) Acetaminophen
 - d) CBD
 - 4) Anti-gout drugs
 - a) Gout
 - b) MOA of anti-gout drugs
- E. The endocrine system
 - 1. Introduction to the endocrine system
 - a. Hypothalamic-pituitary axis
 - b. Anterior pituitary growth hormone
 - 2. Pharmacology of the endocrine system
 - a. Adrenal steroids
 - 1) Regulating adrenocorticoid secretions
 - 2) Glucocorticoids
 - 3) Mineralocorticoids
 - 4) Special considerations
 - 5) Drug interactions
 - b. Thyroid gland
 - 1) Thyroid function
 - 2) Thyroid disorders
 - 3) Drug therapy affecting thyroid glands
 - c. Pancreatic hormones and antidiabetic drugs
 - 1) Pancreatic endocrine function
 - 2) Diabetes mellitus
 - 3) Treatment of diabetes
 - a) Parenteral antidiabetic drugs: insulin
 - b) Oral antidiabetic drugs: secretagogues and hypoglycemics
 - c) Other oral antihyperglycemic drugs
 - d) Non-pharmacological methods of controlling hyperglycemia
- F. The exocrine system
 - 1. Anatomy and physiology of the renal system
 - 2. Conditions associated with renal dysfunction
 - 3. Pharmacology of the vascular and renal systems
 - a. Diuretics
 - b. Types of diuretics
 - 1) Osmotic diuretics
 - 2) Carbonic anhydrase inhibitors
 - 3) Thiazide and thiazide-like diuretics
 - 4) Loop/organic acid diuretics
 - 5) Potassium sparing diuretics
 - 6) ADH antagonists and miscellaneous diuretics
- G. The muscular-skeletal system
 - 1. General overview of the muscular-skeletal system
 - 2. Hormones correlated with the skeletal system
 - a. Parathyroid hormones
 - b. Drug therapy affecting parathyroid glands
 - 1) Bone degeneration
 - 2) Degenerative bone disease: osteoporosis
- H. The reproductive system
 - 1. Gonadal hormones, oral contraceptives and erectile dysfunction drugs
 - a. Female sex hormones
 - b. Hormonal replacement therapy
 - 1) Oral contraceptives
 - c. Fertility drugs
 - d. Posterior pituitary hormones
 - 1) Antidiuretic hormones

- 2) Oxytocin
- 3) Drugs affecting uterine muscle
- 4) Tocolytics
- e. Male sex hormones
- 1) Erectile dysfunction
- I. Identify the pharmacological components of the top 100 most commonly prescribed drugs in the current year; generic name, brand name, classification and special considerations

Discipline(s)

Pharmacy Technology

Lab Content

Not applicable.

Special Facilities and/or Equipment

Computer facility, multimedia, CD-ROM with animations.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

- Objective exams
- Oral presentations
- Cooperative learning assignments
- Research papers
- Projects
- Case studies

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

- Lecture presentations
- Classroom discussion regarding lecture content
- Individual or group presentations regarding research topics, followed by in-class discussion and evaluation
- Small group recitation sessions to discuss case studies, with an emphasis on collaborative learning

Representative Text(s) and Other Materials

Hitner, Henry, and Barbara Nagle. Pharmacology: An Introduction, 7th ed.. 2016.

Ballington, Don, and Robert Anderson. Pharmacy Practice for Technicians, 6th ed.. 2017.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

- A. Weekly reading assignments from text and outside sources, ranging from 20-30 pages per week.
- B. Review of lecture notes, outlines, handouts and relevant reading material.
- C. Participating in critical thinking and case study exercises.
- D. Exploring websites on related topics covered in lecture.
- E. Completing review questions in textbook.
- F. Research and planning of individual projects.