

Course Title	Pharmacology				
Course Code	MED-303				
Course Type	Required				
Level	Undergraduate				
Year / Semester	Year 3/ Semester 5 (Fall)				
Teacher's Name	Course Lead: Dr Katerina Prokopiou Contributors: Dr Persoulla Nicolaou Prof Aleksandar Jovanovic				
ECTS	6	Lectures / week	4	Laboratories / week	0
Course Purpose and Objectives	The main objectives of this course are: <ul style="list-style-type: none"> • To describe the principles governing drug actions in humans. • To illustrate the principles of receptor theory, identify different types of drug targets and their relevant use. • To describe the process of drug absorption, distribution, metabolism and excretion. • To identify different types of drug targets in the autonomic nervous system and to describe their relevant use. • To identify different types of drug targets in the central nervous system and to describe their relevant use. • To describe pain management with the use of analgesics and identify the types of anti-inflammatory drugs and their relevant use. • To explain types of drug interaction, adverse drug reactions and how individual variations can affect the pharmacokinetic and pharmacodynamics parameters of a drug. • To describe the pharmacological principles governing management of common disorders affecting the respiratory and gastrointestinal systems. • To list the main drugs, or classes of drugs, that relieve symptoms, produce a cure or improve prognosis and/or reduce risk of recurrence for conditions related to the respiratory and gastrointestinal systems. 				
Learning Outcomes	The following list provides the learning objectives that will be covered in the lectures, and tutorials of each week: Week 1				

Lobs covered during lectures and tutorials:

1. Describe in general the principles of drug action (pharmacodynamics and pharmacokinetics).
2. Explain the stages of drug discovery, preclinical and clinical development of a drug.
3. Describe the various terms such as agonist, antagonist, affinity, efficacy, and potency with reference to drugs.
4. Outline the interaction between drug and receptor.
5. Describe the effects of drugs on different receptor types and other effector systems at the molecular level.
6. Describe the process of receptor sensitization and desensitization and provide examples of drugs that affect these processes.
7. Describe the effect of liberation, absorption, and first-pass effect on bioavailability.

Week 2

Lobs covered during lectures and tutorials:

8. Define distribution, volume of distribution and describe their effects on drug action.
9. Define the blood brain barrier and list the considerations that determine whether a drug will gain access to the central nervous system.
10. Describe the role of the liver in drug metabolism.

Week 3

Lobs covered during lectures and tutorials:

11. Describe the role of the kidney in drug excretion.
12. Describe the various routes of administration and outline the considerations for choosing an appropriate route of administration.
13. Describe the terms clearance, steady-state, zero-order and first-order kinetics and explain their importance.
14. Identify the molecular, cellular and biochemical sites where drugs can act to affect the parasympathetic system.

Week 4

Lobs covered during lectures and tutorials:

15. Identify the molecular, cellular and biochemical sites where drugs can act to affect the parasympathetic system.
16. Identify the molecular, cellular and biochemical sites where drugs can act to affect the sympathetic system.

Week 5

Lobs covered during lectures and tutorials:

17. Describe the effect of drugs on the major neurotransmitters in the central nervous system, their associated receptors and their predominant pathways.
18. Describe the mechanism of action and indication of the main types of sedative/hypnotics and their side effects.
19. Describe the mechanism of action and indication of the main types of anti-seizure drugs and their side effects.
20. Describe the mechanism of action and indication of the main types of general anaesthetics and their side effects.

Revision.

Week 6

Lobs covered during lectures and tutorials:

21. Describe the mechanism of action and indication of the main types of local anaesthetics and their side effects.
22. Describe the mechanism of action and indication of the main types of muscle relaxants and their side effects.

Online Formative Midterm Exam

Week 7

Lobs covered during lectures and tutorials:

23. Describe the mechanism of action and indication of the main types of drugs involved in movement disorders and their side effects.
24. Describe the mechanism of action and indication of the main types of anti-psychotics drugs and their side effects.

Week 8

Lobs covered during lectures and tutorials:

25. Describe the mechanism of action and indication of the main types of anti-depressant drugs and their side effects.
26. Describe the mechanism of action and indication of the main types of analgesics and their side effects.
27. Describe the mechanism of action and indication of the main types of anti-inflammatory drugs and their side effects.

Week 9

Lobs covered during lectures and tutorials:

28. Describe the mechanism of action and indication of the main types of anti-inflammatory drugs and their side effects.

29. Revise the autonomic innervation of the respiratory system.
30. Outline the pathophysiology of asthma.
31. Describe the mechanism of action, adverse effects and place in therapy of β -2 agonists and methylxanthines in the treatment of asthma.
32. Describe the mechanism of action, adverse effects and place in therapy of leukotriene inhibitors, lipooxygenase inhibitors and anti-inflammatory drugs in the treatment of asthma.
33. Outline the pathophysiology of chronic obstructive pulmonary disease (COPD).
34. Describe the mechanism of action, adverse effects and place in therapy of drugs used to treat COPD.

Week 10

Lobs covered during lectures and tutorials:

35. Describe the clinical indications, mechanism of action and adverse effects of other drugs affecting the respiratory system, specifically anti-histamines, expectorants, mucolytics, cough suppressants and decongestants.
36. Explain how bleomycin, amiodarone, oxygen, tobacco and cocaine may adversely affect the respiratory system.
37. Outline the regulation of gastric acid secretion.
38. Describe the clinical indications, place in therapy, mechanism of action and adverse effects of drugs used to reduce or neutralize gastric acid.

Week 11

Lobs covered during lectures and tutorials:

39. Outline the factors and mechanisms that may induce vomiting.
40. Describe the pharmacology of anti-emetic drugs, including clinical indications, mechanism of action and adverse effects.
41. Describe the pharmacology of drugs that alter the motility of the GI tract, including their clinical indications, mechanism of action and adverse effects.
42. Describe the pharmacology of drugs used to treat inflammatory bowel disease, including their clinical indications, place in therapy, mechanism of action and adverse effects.
43. Outline the rationale for pharmacological treatment of chronic pancreatitis and cholestasis.
44. List drugs that may cause pancreatitis or cholestasis.
45. Briefly revise the physiology of fluid and electrolyte balance.
46. Describe the basic principles of fluid and electrolyte administration.
47. Outline the clinical indications for fluid and electrolyte administration.

	<p>Week 12</p> <p><i>Lobs covered during lectures and tutorials:</i></p> <p>48. Explain why the liver is particularly susceptible to drug induced damage.</p> <p>49. Describe how paracetamol overdose can lead to hepatotoxicity.</p> <p>50. List drugs that may cause hepatotoxicity.</p> <p>51. Outline the rationale for pharmacological treatment of chronic decompensated liver failure.</p> <p>52. Outline the considerations for prescribing in hepatic impairment.</p> <p>Revision.</p>		
Prerequisites	None	Required	None
Course Content	<ul style="list-style-type: none"> • Introduction to pharmacology • Drug discovery and development • How drugs act: General principles • Drug absorption and distribution • Drug metabolism • Chemical mediators and drug action in the autonomic nervous system • Chemical transmission and drug action in the central nervous system • Analgesics and pain control • Anti-inflammatory drugs • Respiratory pharmacology: <ul style="list-style-type: none"> - Asthma - COPD - Drugs used to treat other respiratory disorders • Gastrointestinal drugs <ul style="list-style-type: none"> - Peptic ulcer - GORD - Anti-emetics - Motility - Inflammatory bowel disease - Cholestasis - Pancreatitis - Hepatic failure - Fluids & Electrolytes 		

Teaching Methodology	Lectures, Tutorials.				
Bibliography	Required Textbooks/Reading:				
	Students have the option to choose one from the following two books:				
	Authors	Title	Publisher	Year	ISBN
	Rang, H. P	Rang and Dale's pharmacology 8 th ed.	Churchill Livingstone	2015	9780702034718
	OR				
	Bertram Katzung and Anthony Trevor	Basic and Clinical Pharmacology, 13 th edition	Lange	2014	9780071825054
	Recommended Textbooks/Reading:				
Authors	Title	Publisher	Year	ISBN	
Pavan Bhat, Alexandra Dretler, Mark Gdowski, Rajeev Ramgopal, Dominique Williams	Goodman & Gilman's The Pharmacological Basis of Therapeutics, 35 th ed.	Lippincott Williams & Wilkins	2016	9781469890241	
Goodman & Gilman	Principles of clinical Pharmacology, 13 th ed.	McGraw Hill	2017	9781259584732	
Arthur J Atkinson, Jr, Shiew-Meu Huang, Juan JL Lertora, Sanford P Markey,	BRS Pharmacology, 3 rd ed.	Academic Press	2012	9780123854711	
Rosenfeld Gary C	Lippincott Illustrated Reviews: Pharmacology, 6 th ed.	Lippincott Williams & Wilkins	2014	9781451175356	

	Karen Whalen	The Washington manual of medical therapeutics, 6 th ed.	Wolters Kluwer	2015	9781451191776
Assessment	On-line Formative Midterm Exam and Summative Final Exam. The Summative Final Exam will contribute towards 100% of the course grade. Assessment is by Single Best Answer MCQs (SBAs) and there may also be some Short Answer Questions (SAQs).				
Language	English				