

Course Title	Systematic Pharmacology I				
Course Code	MED-308				
Course Type	Required				
Level	Undergraduate				
Year / Semester	Year 3/ Semester 6 (Spring)				
Teacher's Name	Course Lead: Dr Persoulla Nicolaou Contributor Dr Katerina Prokopiou				
ECTS	6	Lectures / week	4	Laboratories / week	0
Course Purpose and Objectives	<p>The main objective of the course is to describe the pharmacological principles governing management of common disorders affecting the cardiovascular, endocrine, musculoskeletal, and reproductive systems and the skin.</p> <p>In general for each condition studied students should be able to list the main drugs, or classes of drugs, that relieve symptoms, produce a cure or improve prognosis and/or reduce risk of recurrence.</p> <p>For each drug type, students should be able to describe which patients may benefit from its use, its clinical indications, its mechanism of action and the most common or serious side effects.</p>				
Learning Outcomes	<p>The following list provides the learning objectives that will be covered in the lectures and tutorials of each week:</p> <p>Week 1</p> <p>Lobs covered during lectures and tutorials:</p> <ol style="list-style-type: none"> 1. Describe the rationale for pharmacological treatment of hypertension and place in therapy of different anti-hypertensive medication. 2. Describe the clinical indications, mechanism of action and adverse effects of drugs targeting the renin-angiotensin-aldosterone system and calcium channel blockers. 3. Describe the clinical indications, mechanism of action and adverse effects of the different types of diuretics. 4. Explain the pharmacological rationale, adverse effects and place in therapy of hydralazine, β-blockers, α-blockers, centrally-acting drugs and potassium channel activators in the treatment of hypertension. 5. Describe the place in therapy, mechanism of action and adverse effects of drugs used to treat pulmonary arterial hypertension. 6. Outline the treatment options for hypotension and shock. 				

Week 2

Lobs covered during lectures and tutorials:

7. Outline the pathophysiology of heart failure and describe the pharmacological basis for its treatment.
8. Describe the mechanism of action, place in therapy and adverse effects of drugs used to treat heart failure.
9. Outline the phases and ion channels involved in the action potential in cardiac tissue.
10. Describe the indications, mechanism of action, and adverse effects of class I and II anti-arrhythmic drugs.

Week 3

Lobs covered during lectures and tutorials:

11. Describe the indications, mechanism of action, and adverse effects of class III and class IV anti-arrhythmic drugs.
12. Outline the pharmacology of other unclassified anti-arrhythmic drugs.
13. Outline the different types of angina.
14. Describe the rationale and considerations for pharmacological treatment of angina.
15. Outline the process of atherogenesis.
16. Outline lipoprotein transport and identify drug targets for dyslipidaemias.
17. Describe the mechanism of action, side effects and place in therapy of statins in antihyperlipidaemic treatment.

Week 4

Lobs covered during lectures and tutorials:

18. Describe the mechanism of action, side effects and place in therapy of fibrates, cholesterol absorption inhibitors, niacin and other novel antihyperlipidaemic therapies.
19. Describe the mechanism of action, adverse effects and clinical indications for antiplatelet and anticoagulant drugs.
20. Describe the pharmacology of vitamin K and its analogues, including mechanism of action, adverse effects and clinical indications.

Week 5

Lobs covered during lectures and tutorials:

21. Describe the mechanism of action, adverse effects and clinical indications for antiplatelet and thrombolytic drugs.
22. Review the role of insulin, glucagon and incretins in control of blood glucose.

23. Outline the mechanisms resulting in hyperglycaemia in diabetes mellitus.
24. Describe the mechanism of action, adverse effects and place in therapy of drugs used in the treatment of diabetes mellitus.

Week 6

Online Formative Midterm Exam

Lobs covered during lectures and tutorials:

25. Outline the regulation of food intake and energy expenditure.
26. List drugs that may cause weight changes as a side effect.
27. Describe pharmacological interventions used to treat obesity and the challenges of developing effective drugs.
28. Describe the pharmacology of drugs affecting growth hormone (GH) secretion and action, including clinical indications, place in therapy, mechanism of action and adverse effects.
29. Describe the pharmacology of drugs affecting prolactin secretion, including clinical indications, place in therapy, mechanism of action and adverse effects.
30. Describe the effects of drugs on vasopressin action, including mechanism of action, adverse effects and clinical indications.
31. Describe the effects of drugs on the hypothalamic-pituitary-adrenal axis, including mechanism of action, adverse effects and clinical indications.
32. Briefly revise the pharmacology of corticosteroids including mechanism of action, adverse effects and clinical uses.

Week 7

Lobs covered during lectures and tutorials:

33. Outline the synthesis, secretion and physiological actions of thyroid hormones.
34. Describe the pharmacology of drugs used to treat hyperthyroidism and hypothyroidism including clinical indications, place in therapy, mechanism of action and adverse effects.
35. List drugs that may alter thyroid function as a side effect.

Week 8

Lobs covered during lectures and tutorials:

36. Discuss the pharmacological treatment of osteoarthritis (OA) and rheumatoid arthritis (RA) and summarize the major side effects of disease-modifying anti-rheumatic drugs and corticosteroids.

Week 9

Lobs covered during lectures and tutorials:

37. Give examples of drugs that are used for the management of systemic lupus erythematosus (SLE), describing their mechanism of action and major side effects.
38. Outline the clinical features of drug-induced lupus and give examples of drugs which cause this.
39. Outline strategies for the prevention and treatment of rickets and osteomalacia.
40. Describe the mechanism of action, place in therapy and side effects of drugs used in the treatment of back pain, gout and osteoporosis.

Week 10

Lobs covered during lectures and tutorials:

41. Describe the mechanism of action, place in therapy and major side effects of drugs (including anti-inflammatories, retinoids and biological drugs) for eczema, psoriasis and other common skin conditions.
42. Describe the use of sunscreen and emollients in common skin conditions.

Week 11

Lobs covered during lectures and tutorials:

43. Outline the hormonal control of the menstrual cycle.
44. Describe the mechanism of action, route of administration and adverse effects of contraceptives.
45. Outline special considerations when choosing a contraceptive."
46. Outline the rationale for clinical indications of oestrogens and progesterones.
47. List the drugs used in postmenopausal hormone replacement.
48. Describe the benefits and drawbacks of hormone replacement therapy.
49. Describe the pharmacology of androgen and anti-androgen drugs, including mechanism of action, clinical uses and adverse effects.
50. Outline the classes of drugs that are being abused and the biological processes underlying drug dependence.
51. Describe changes in pharmacodynamics and pharmacokinetics that may occur with age and explain what is meant by polypharmacy.

Week 12

Lobs covered during lectures and tutorials:

	<p>52. Describe the pharmacology of drugs used to treat female infertility, including their mechanism of action, adverse effects and clinical indications.</p> <p>53. Outline the rationale for pharmacological treatment used to increase testosterone levels and spermatogenesis in male infertility.</p> <p>54. Describe the pharmacology of drugs used to treat erectile dysfunction, including their mechanism of action, adverse effects and clinical indications.</p> <p>55. List drugs that may cause priapism.</p> <p>56. Describe the principles of selecting medicines during pregnancy.</p> <p>57. List drugs that should be avoided in pregnancy and explain their adverse effects during pregnancy.</p> <p>58. Describe the pharmacology of drugs used for labour induction and postpartum haemorrhage, including mechanism of action, clinical indications and adverse effects.</p> <p>59. Describe the pharmacology of tocolytic drugs, including mechanism of action, clinical indications and adverse effects.</p> <p>60. Describe the pharmacology of abortifacients, including mechanism of action, clinical indications and adverse effects.</p> <p>61. Describe the principles of selecting medicines during breastfeeding.</p> <p>62. List drugs that should be avoided in breastfeeding and explain their adverse effects.</p> <p>63. List adverse effects of drugs on the reproductive system.</p> <p>64. Outline single-gene pharmacogenetic disorders and pharmacogenomic testing that is clinically available.</p> <p>65. Describe the risks of multiple drug therapy, including those from drug interactions and incorrect usage of medication.</p> <p>66. Describe the different types of adverse drug reactions and give examples of each type.</p>		
Prerequisites	MED-303 Pharmacology	Required	None
Course Content	<p><u>Topics covered in lectures:</u></p> <p>Drugs used on specific body systems or against specific conditions:</p> <p>Cardiovascular pharmacology</p> <ul style="list-style-type: none"> • Hypertension • Pulmonary arterial hypertension • Hypotension • Heart failure • Anti-arrhythmic drugs • Angina • Anti-hyperlipidaemics 		

- Anticoagulant, antiplatelet and thrombolytic drugs

Endocrine Pharmacology

- Diabetes mellitus
- Obesity
- Drugs affecting somatotrophic, pituitary, hypothalamic and adrenal cortex hormones
- Drugs affecting thyroid function

Musculoskeletal pharmacology

- Rheumatoid arthritis
- Osteoarthritis
- Systemic Lupus erythromatosus
- Rickets and osteomalacia
- Back pain
- Gout
- Osteoporosis

Skin pharmacology

- Eczema
- Psoriasis
- Common skin conditions

Reproductive pharmacology

- Contraceptives
- Hormone-replacement therapy
- Infertility
- Erectile dysfunction
- Pregnancy
- Labour
- Abortifacients
- Breastfeeding.

Other topics

- Drug addiction, dependence and abuse
- Drug interaction
- Individual variations, aging and polypharmacy
- Harmful effects of drugs

Topics covered in tutorials:

Case studies/practice questions.

Teaching Methodology	Lectures, Tutorials.				
Bibliography	Required Textbooks/Reading:				
	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
	Kaplan	Lippincott Illustrated Reviews: Pharmacology	Kaplan Medical	2017	9781506208398
	Karen Whalen	The Washington manual of medical therapeutics, 6 th ed.	Wolters Kluwer	2015	9781451191776
	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,	BRS Pharmacology,	Academic Press	2012	9780123854711	

	Shiew-Meu Huang, Juan JL Lertora, Sanford P Markey,	3 rd ed.			
	Rosenfeld Gary C	Lippincott Illustrated Reviews: Pharmacology, 6 th ed.	Lippincott Williams & Wilkins	2014	9781451175356
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				