

<b>Course Code</b> MED-402	<b>Course Title</b> Systematic Pharmacology II	<b>ECTS Credits</b> 6
<b>School</b> Medical School	<b>Semester</b> Fall (Semester 7)	<b>Prerequisites</b> MED-304 Pharmacology MED-308 Systematic Pharmacology I
<b>Type of Course</b> Required	<b>Field</b> Medicine	<b>Language of Instruction</b> English
<b>Level of Course</b> Undergraduate	<b>Year of Study</b> 4th	<b>Course Lead:</b> <b>Prof Aleksandar Jovanovic</b>  <b>Other lecturers:</b> <b>Dr Soulla Nicolaou</b>
<b>Mode of Delivery</b> Face-to-face.		

#### Objectives of the Course:

The main general objective of this course is to develop proficiency in using drugs for treatment and/or prevention of main diseases and medical conditions. Students should be able to list and describe main drugs aimed to prevent, alleviate symptoms, cure, improve prognosis and/or reduce risk of recurrence for each studied disease/medical condition.

For each drug type, students should be able to describe which patients may benefit from its use, likely mechanism of actions, the most common adverse effects and major contraindication. Students should learn therapeutic regimens against main diseases/medical conditions, how to counsel patients regarding use of drugs and how to prescribe drugs in appropriate doses using British National Formulary and similar pharmaceutical reference books. Students should learn how to tailor therapies for each individual patient (taking into consideration gender, age and other patient characteristics) to achieve maximal therapeutic efficacy and safety.

This course covers drugs that are system-specific and/or target specific clinical conditions.

#### Learning Outcomes:

After completion of the course students are expected to be able to:

##### Week 1

##### **Lobs covered during lectures and tutorial:**

1. Describe the pharmacology of drugs used to treat female infertility, including their mechanism of action, adverse effects and clinical indications.
2. Outline the rationale for pharmacological treatment used to increase testosterone levels and spermatogenesis in male infertility.

3. Describe the pharmacology of drugs used to treat erectile dysfunction, including their mechanism of action, adverse effects and clinical indications.
4. List drugs that may cause priapism.
5. Describe the principles of selecting medicines during pregnancy.
6. List drugs that should be avoided in pregnancy and explain their adverse effects during pregnancy.
7. Describe the pharmacology of drugs used for labour induction and postpartum haemorrhage, including mechanism of action, clinical indications and adverse effects.
8. Describe the pharmacology of tocolytic drugs, including mechanism of action, clinical indications and adverse effects.
9. Describe the pharmacology of abortifacients, including mechanism of action, clinical indications and adverse effects.
10. Describe the principles of selecting medicines during breastfeeding.
11. List drugs that should be avoided in breastfeeding and explain their adverse effects.
12. List adverse effects of drugs on the reproductive system.

## Week 2

### ***Lobs covered during lectures and tutorial:***

13. Describe the main structures and functions of microbes and principles of anti-microbial drug action, anti-microbial drug resistance and adverse effects of antimicrobial drugs.
14. List and classify anti-bacterial drugs.
15. Describe mechanisms of action of all groups of anti-bacterial drugs.
16. Describe adverse effects of all groups of anti-bacterial drugs.
17. Describe clinical use, indications and contraindications for all groups of anti-bacterial drugs.
18. Describe mechanisms of action and classification of anti-viral drugs.
19. Describe clinical use and adverse effects of antiviral drugs.

## Week 4

### ***Lobs covered during lectures and tutorial:***

20. Classify antifungal drugs and describe their mechanisms of action, clinical use and adverse effects.
21. Classify antiprotozoal and antihelminthic drugs and describe their mechanisms of action, clinical use and adverse effects.
22. List vaccines and describe their action, administration and adverse effects.
23. Describe cell cycle, special characteristics of cancer cells and mechanisms of action of anti-cancer drugs.
24. List and classify anti-cancer drugs.
25. Describe clinical use and adverse effects of all groups of anti-cancer drugs.
26. Describe strategies against adverse effects of anti-cancer drugs.

## Week 6

### **Midterm Exam**

## Week 8

### ***Lobs covered during lectures and tutorial:***

27. Describe mechanisms of action, clinical use and adverse effects of protein kinase inhibitors and miscellaneous anti-cancer agents (Anti-cancer drugs continued).

28. Describe the hematopoietic system, list and classify anemias.
29. List and classify anemias.
30. Describe therapeutic use and adverse effects of iron.
31. Describe vitamins used to treat disorders of the hematopoietic system, including mechanisms of action, clinical use and adverse effects.
32. Describe hematopoietic growth factors, their clinical use, mechanisms of action and adverse effects.
33. List and classify drugs used to treat glaucoma, including their mechanism of action, therapeutic and adverse effects.
34. Define clinical pharmacology.
35. Describe optimizing use of current medicines.
36. Describe principles of pharmacodynamics, dose-effect analysis and defining optimal dose.
37. Describe principles of pharmacokinetics and the target concentration strategy.
38. Describe/list drug toxicities and underlying mechanisms.

### Week 10

#### ***Lobs covered during lectures and tutorial:***

39. Describe/list possible drug interactions. Learn how to predict drug interactions.
40. Describe pharmacological differences between men and women at the level of pharmacokinetics and pharmacodynamics.
41. Define clinical pharmacogenetics, describe principles of pharmacogenetics and examples of important genetic polymorphism.
42. Describe ontogeny of pharmacokinetics and pharmacodynamics in children and consequent therapeutic considerations
43. Describe age-related changes in pharmacokinetics and effector system functions, and consequent therapeutic considerations.
44. Describe general principles of prescribing and common pitfalls.

#### **Course Contents:**

- Reproductive pharmacology III: Infertility.
- Reproductive pharmacology IV: Erectile dysfunction and Pregnancy.
- Reproductive pharmacology IV: Labour, abortifacients and breastfeeding.
- Antimicrobial drugs: Basic principles.
- Antibacterial drugs: Sulfonamides and b-lactams.
- Antibacterial drugs: Tetracyclines, amphenicols and aminoglycosides.
- Antibacterial drugs: Macrolides, drugs acting on topoisomerase, anti-mycobacterium and less-common antibacterial drugs.
- Antiviral drugs: Reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, protease inhibitors and DNA polymerase inhibitors.
- Antiviral drugs: Neurominadise inhibitors and inhibitors of viral coat assembly and other antiviral agents.
- Antifungal drugs: Antifungal antibiotics.
- Antifungal drugs: Synthetic and other antifungal drugs.
- Antiprotozoal and antihelminthic drugs.
- Vaccines: Di-Te-Per, meningococcal, haemophilys influenzae, hepatitis and human papillomavirus vaccines.
- Vaccines: Influenzae, MMR, Pneumococcal, Poliomyelitis, Varicella, herpes zoster

vaccines and passive immunization.

- Cancer Therapeutics: Mechanisms of action and basic principles.
- Cancer Therapeutics: Alkylating and related agents and antimetabolites.
- Cancer Therapeutics: Cytotoxic antibiotics and plant derivatives.
- Cancer Therapeutics: Hormones and hormone antagonists.
- Cancer Therapeutics: Protein kinase inhibitors and miscellaneous agents.
- Drugs used to treat disorders of the hematopoietic system: Hematopoietic system, anaemia and iron.
- Drugs used to treat disorders of the hematopoietic system: Vitamins.
- Drugs used to treat disorders of the hematopoietic system: Hematopoietic growth factors.
- Drugs used to treat glaucoma.
- Principles of clinical pharmacology: Optimizing use of existing medicines and principles of evaluations.
- Principles of clinical pharmacology: Clinical pharmacodynamics.
- Principles of clinical pharmacology: Clinical pharmacokinetics.
- Principles of clinical pharmacology: Drug toxicity.
- Principles of clinical pharmacology: Drug interactions.
- Principles of clinical pharmacology: Pharmacological differences between men and women.
- Principles of clinical pharmacology: Clinical Pharmacogenetics.
- Principles of clinical pharmacology: Pediatric clinical pharmacology and therapeutics.
- Principles of clinical pharmacology: Drug therapy in elderly.
- Principles of clinical pharmacology: Principles of drug prescribing.

**Learning Activities and Teaching Methods:**

Lectures, Tutorials.

**Assessment Methods:**

Midterm Exam and Final Exam. Assessment is by Single Best Answers (SBAs) and Short Answer Questions (SAQs).

**Required Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
Rang, H. P	Rang and Dale's pharmacology.	Churchill Livingstone	2016	9780702053627

**Recommended Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
	Step 1 Lecture Notes 2017 in Pharmacology.	Kaplan	2017	9781506208398
Rosenfeld Gary C	BRS Pharmacology	Lippincott Williams & Wilkins	2014	9781451175356

<b>Pavan Bhat, Alexandra Dretler, Mark Gdowski, Rajeev Ramgopal, Dominique Williams</b>	<b>The Washington manual of medical therapeutics</b>	<b>Lippincott Williams &amp; Wilkins</b>	<b>2016</b>	<b>9781469890 241</b>
<b>Goodman &amp; Gilman</b>	<b>Goodman &amp; Gilman's The Pharmacological Basis of Therapeutics</b>	<b>McGraw Hill</b>	<b>2011</b>	<b>9780071624 428</b>
<b>Arthur J Atkinson, Jr, Shiew-Meu Huang, Juan JL Lertora, Sanford P Markey,</b>	<b>Principles of clinical Pharmacology</b>	<b>Academic Press</b>	<b>2012</b>	<b>9780123854 711</b>