

## REQUIREMENTS

<b>Semmelweis University Faculty of Dentistry</b> Department of Pharmacology and Pharmacotherapy (Faculty of Medicine)
<b>Name of the course: Pharmacology I</b> <b>Credit value: 4</b> <b>Lessons (<i>in hours</i>): 56    lectures: 28    practicals: 28</b> <b>Type of the course: compulsory</b> <b>Frequency of announcement (<i>per semester or year</i>): per year</b>
<b>Academic year: 2020/21, 1. semester</b>
<b>Subject code<sup>1</sup>: FOKOFRM254_1A</b>
<b>Lecturer of the course: László Köles, MD, PhD, Associate Professor</b> <b>Contact: Semmelweis University, Dept. of Pharmacology and Pharmacotherapy (Faculty of Medicine)</b>
<b>The goals of the course in point of view of the education:</b> Pharmacology deals with the effects, mechanisms of actions, adverse effects, interactions and clinical administration of drugs used in the clinical practice as well as with their fate in the body. It also specifies the rules of prescription writing. It is based on and synthesizes the knowledge of basic, pre-clinical and clinical subjects such as physiology, biochemistry, oral pathology and internal medicine.
<b>Location of the course (<i>address of lecture hall, seminar room etc.</i>):</b> NET, 1089 Budapest, Nagyvárad tér 4
<b>Competences acquired by completion of the course:</b> Students understand the pharmacological terminology, learn the mechanism of action, therapeutic effects, adverse effects, important interactions of drugs and the basics of dosing. Knowing the basics of prescribing drugs is of an utmost importance.
<b>Pre-study requirements and prerequisites of course registration and completion:</b> Pathology, Medical and dental physiology II., Dental biochemistry II
<b>Number of students required for announcement of course (<i>min., max.</i>): -</b>
<b>Method of course registration:</b> Through the NEPTUN system
<b>Detailed course/lecture description<sup>2</sup>:</b> ( <i>to facilitate credit recognition in other institutions</i> ) <ol style="list-style-type: none"><li>1. Introduction to pharmacology. Pharmacodynamics I.</li><li>2. Pharmacokinetics. Pharmacodynamics II.</li><li>3. Basics of the neurotransmission of autonomic nervous system. Pharmacology of the cholinergic systems. Parasympathomimetics. Parasympatholytics.</li><li>4. Pharmacology of the adrenergic system. Sympathomimetics and sympatholytics</li><li>5. Skeletal muscle relaxants. Pharmacology of the smooth muscles.</li><li>6. Drugs used in coagulation disorders, drugs against bleeding. Agents used in anemias.</li><li>7. Antiarrhythmic drugs. Positive inotropic agents. Treatment of acute and chronic heart failure.</li><li>8. Diuretics and antidiuretics. Antihypertensive agents</li></ol>

9. Antihyperlipidemic drugs. Drugs used for treatment of angina pectoris. Drugs used for the treatment of peripheral vascular diseases.
10. Bronchodilators. Antiinflammatory agents used in bronchial asthma. Antitussive agents and expectorants. Histamin and antihistamines.
11. Corticosteroids. Pituitary hormones and hypothalamic hormones controlling their production. Hormonanalogs and hormone antagonists. Thyroid hormones and antithyroid drugs.
12. Drugs affecting bone mineral homeostasis. Drugs acting on blood glucose control. Antidiabetics.
13. Estrogens and antiestrogens. Progestins and antiprogestins. Contraceptives. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity.
14. Biological Drugs. Orphan Drugs. Advanced Therapy Medicines. Nutrients, traditional plant medicines, vitamins, anorectic drugs.

Prescription writing continuously during the whole semester.

**Courses (*obligatory and elective*) which in part or entirely overlap the topics of above course:**

Medical and dental physiology, Dental biochemistry, Molecular Cell Biology, Pathology, General and Oral Pathophysiology, Internal Medicine

**Special academic work required for completion of the course<sup>3</sup>: -**

**Attendance on practices and lectures, replacement in case of missed sessions:**

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence the student can attend another class the same week.

**Consequences of absence from sessions and exams:**

According to the Study and Examination Policy of Semmelweis University

**Method of checking acquired knowledge during the study period<sup>4</sup>:**

Obligatory midterms are not organized. If the students ask it, 2 written midterms will be arranged.

**Requirements of an accepted semester (*signature of the lecturer*):**

The number of absences must not be more than 25 percent of the number of practices in the semester

**Type of the exam:**

oral semifinal exam

**Requirements of the exam<sup>5</sup>:**

In the oral exam one question from each question list have to be drawn and to be answered. Acceptable knowledge must be proven.

Topic list "A"

1. Pharmacodynamics I (Molecular targets of drugs. Drug receptors. Receptor theory.)
2. Pharmacodynamics II (relation between drug dose and clinical response in the population. Therapeutic index. Tolerance.
3. Drug absorption, permeation, and distribution. Bioavailability and volume of distribution. Membrane transport mechanisms.
4. Drug biotransformation, and excretion. Linear and non-linear kinetics. Enzyme inhibition and induction. Clearance, half-life, loading and maintenance dose. Enzyme inducers and inhibitors.
5. Smooth muscle relaxants used for relief GI and UG spasms. Drugs influencing uterus functions.
6. Histamine and antihistamines.
7. Glucocorticoids for oral and parenteral use.
8. Mineralocorticoids. Topically applied glucocorticoids. Inhibitors of glucocorticoid synthesis.
9. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity
10. Estrogens, SERM and antiestrogens.
11. Progestins and antiprogestins. Contraceptives.
12. Thyroid and antithyroid drugs. Hypothalamic and pituitary hormones.
13. Pancreatic hormones and parenterally applied antidiabetic drugs.
14. Oral antidiabetics.
15. Agents that affect bone mineral homeostasis (calcium, vitamin D, parathyroid hormone, calcitonin, etc.).
16. Drugs used in disorders of coagulation I: Antiplatelet agents.
17. Drugs used in disorders of coagulation II: Anticoagulants.
18. Drugs used in disorders of coagulation III: Fibrinolytics. Drugs used in bleeding disorders.
19. Agents used in anemias.

Topic list "B"

1. Cholinergic transmission and its presynaptic modification.
2. Adrenergic transmission and its presynaptic modification
3. Parasympathomimetics
4. Parasympatholytics
5. Catecholamines
6. Indirect sympathomimetics. Selective  $\alpha_1$ -agonists. Selective  $\alpha_2$ -agonists and drugs acting on the imidazoline receptors.

7.  $\alpha$ -receptor antagonists
8.  $\beta$ -receptor antagonists
9. Centrally acting skeletal muscle relaxants (spasmodics). Dantrolene. Botulinum toxin
10. Skeletal muscle relaxants acting on the neuromuscular junction.
11. Selective  $\beta_2$ -agonists and other bronchodilators.
12. Antiinflammatory agents used in bronchial asthma. Antitussive agents and expectorants.
13. Drugs used for treatment of congestive heart failure. I: Drugs decreasing the load on the heart.
14. Drugs used for treatment of congestive heart failure. II: positive inotrop drugs.
15. Antiarrhythmic agents
16. Antihypertensive drugs I. Classification of antihypertensive agents and their mechanisms of action
17. Antihypertensive drugs II. Ca-channel blockers and other vasodilators. Drugs used for the treatment of peripheral vascular diseases.
18. Antihypertensive drugs III. Drugs influencing the activity of the renin-angiotensin-aldosterone system
19. Drugs used for treatment of angina pectoris
20. Antihyperlipidemic drugs.
21. Potassium excreting diuretics
22. Potassium sparing diuretics, ADH antagonists, osmotic diuretics.

**Grading of courses<sup>6</sup>:**

According to the knowledge proven at the exam.

**Exam registration:**

Registration must be done through the NEPTUN system for the days set by the department up to the limits.

**Rules of repeating exams:**

According to the Study and Examination Policy of Semmelweis University

**List of textbooks, lecture notes and recommended textbooks:**

Basic and Clinical Pharmacology (Ed. B. G. Katzung), 14th edition, McGraw-Hill Education, 2018. ISBN 978-1-260-28817-9

Materials discussed during lectures and seminars: <http://semmelweis.hu/pharmacology>, Moodle (<https://itc.semmelweis.hu>)

**Signature of course lecturer:**



**Signature of head of department:**



**Date of submission:**

**Opinion of OKB:**

**Notes from the Dean's Office:**

**Signature of Dean:**

<sup>1</sup> Filled out by the Dean's Office following approval

<sup>2</sup> Detailed and numbered for each week of theoretical and practical lessons one by one, indicating the names of lecturers and instructors

<sup>3</sup> Eg. field practice, medical chart analysis, survey conducting, etc.

<sup>4</sup> Eg. homework, report, midterm exam etc. Topics, dates, method of retake and replacement.

<sup>5</sup> List of topics in case of theoretical exam, thematic and method in case of practical exam.

<sup>6</sup> Method of inclusion of theoretical and practical exams. Method of inclusion of midterm assessments.