



## DESCRIPTION OF THE SUBJECT (MODULE)

| Name of the subject (module) | Code |
|------------------------------|------|
| Pharmacology 2/2             |      |

| Lecturer(s)  | Unit(s)   |
|--|---|
| <b>Coordinator:</b> Assoc. Prof. Dr. Kristina Garuolienė | Faculty of Medicine, Institute of Biomedical Sciences,<br>Centre of Pharmacy and Pharmacology, Geležinio Vilko<br>str.29 a, Vilnius<br>El.p. kristina.garuoliene@mf.vu.lt |

| Annotation   |
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| The aim is to develop the pharmacological knowledge of the pharmacy student; acquire knowledge of medicinal products; analyze scientific data on medicines and their action. |

| Graduate                             | Subject (module) level | Type of subject (module) |
|--------------------------------------|------------------------|--------------------------|
| Integrated studies (I and II cycles) | 2 of 2                 | Compulsory               |

| Form of implementation                   | Execution period | Implementation language(s) |
|--|------------------|----------------------------|
| Lectures and workshops in the auditorium | Spring Semester  | Lithuanian                 |

| Requirements for the student  |
|---|
| <b>Prerequisites:</b> the student must have listened to subjects - human anatomy, human physiology, pathological physiology.<br><b>Concurrent requirements (if any):</b> none |

| Scope of the subject (module) in credits | Student's full workload | Contact working hours | Self-employment hours |
|--|-------------------------|-----------------------|-----------------------|
| 10                                       | 270 hours               | 128                   | 142                   |

| Objective of the subject (module): competences developed by the study programme  |
|--|
| The aim is to develop the knowledge of the student of the pharmacy specialty, the ability to understand the processes of pharmacology; develop the ability to work in a team together with other students; to be able to think critically and self-critically. |

|     | Subject (module) study objectives   | Study methods   | Assessment methods |
|-----|---|---|--------------------|
| 1.5 | will be able to apply the latest knowledge of the processes of drug metabolism and their effects, the action of toxic substances, and the function and use of medicinal products in practice; | Research-based and problem-oriented learning. Work during exercises and seminars. Analysis of clinical situations | Colloquium         |

|      |  |  |   |
|------|--|--|---|
| 3.6  | will be able to evaluate research data on medicinal products and provide information and advice on medicinal products to patients and other healthcare professionals, including information on rational use of medicines;  | Lectures in the Virtual Learning Environment (VMA), lectures, seminars   | Colloquium  |
| 3.7. | will be able to identify, characterise, and record suspected adverse drug reactions and provide information on such cases to competent authorities   | Case study method, discussions, problem-oriented learning. Work during seminars  | Formative assessment, independent work and task solving |
| 5.4  | is able to think analytically, apply the latest research findings in professional activities, and be creative working at the junction of pharmaceutical and various other fields of science;   | Case study method, discussions, problem-oriented learning. Work during seminars  | Formative assessment, independent work and task solving |
| 6.4  | The graduate must use critical, systemic and creative thinking in solving different issues and making decisions, try to anticipate the most problematic areas and take preventive measures, and, when problems arise, develop unique problem-solving algorithms in order to find the best solutions to issues; | Purposeful and experiential learning, discussions, reflection in groups and in the audience. Work during exercises and seminars. | Formative assessment, independent work and task solving |

| Themes   | Contact working hours |              |           |           |                 |          |                   | Self-study times and tasks |   |
|--|-----------------------|--------------|-----------|-----------|-----------------|----------|-------------------|----------------------------|---|
|  | Lectures              | Consultation | Workshops | Exercises | Laboratory work | Practice | Full contact work | Self-employment            | Tasks   |
| 1. Drugs that affect the cardiovascular system. Drugs that affect the kidneys and urinary system. Hyperlipidemic drugs | 6                     |              | 2         | 10        |                 |          | 18                | 20                         | Read the literature of 1 topic. (21-23, 29 sk.) Prepare for seminars and exercises. |
| 2. Hemostasis, thrombosis, hematopoietic system. Drugs for the treatment of anemia.                                    | 4                     |              | 2         | 2         |                 |          | 8                 | 10                         | Read the literature of 2 topics. (24-25 sk.) Prepare for seminars and exercises.    |
| 3. Medicines that affect the respiratory system  | 2                     |              |           | 2         |                 |          | 4                 | 4                          | Read the literature of 3 topics. (28 sk.) Prepare for the exercise.                 |

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| 4. Drugs that affect the digestive system.  | 2 |  | 2 | 2 |  |  | <b>6</b>  | 6  | Read the literature of 4 topics. (30 sk.) Prepare for seminars and exercises.     |
| 5. Drugs that affect the endocrine system. Hormones of the hypothalamus and pituitary gland. Sex hormones and their antagonists | 2 |  |   | 4 |  |  | <b>6</b>  | 8  | Read the literature of 5 topics. (33.35 Sk.) Prepare for the exercise.            |
| 6. Endocrine drugs. Thyroid and antithyroid drugs.  | 2 |  |   | 4 |  |  | <b>6</b>  | 6  | Read the literature on 6 topics. (34 sk.) Prepare for the exercise.               |
| 7. Endocrine drugs. Medications for the treatment of diabetes mellitus  | 2 |  |   | 4 |  |  | <b>6</b>  | 8  | Read the literature on 7 topics. (31 sk.) Prepare for the exercise.               |
| 8. Anti-inflammatory, immunosuppressants and drugs that modify the course of the disease. Medicines for rheumatic diseases      | 2 |  |   | 4 |  |  | <b>6</b>  | 8  | Read the literature on 8 topics. (26 sk.) Prepare for the exercise.               |
| 9. Medicines for the treatment of skin diseases   |   |  | 2 |   |  |  | <b>2</b>  | 4  | Read the literature of 9 topics. (27 paragraphs) Prepare for seminars.            |
| 10. Drugs that affect bone mineral homeostasis  |   |  | 2 | 2 |  |  | <b>2</b>  | 2  | Read the literature of 10 topics. (36 sk.) Prepare for seminars.                  |
| 11. Pharmacology of pain. General anesthetics. Local anesthetics. Headache management   | 4 |  | 4 | 2 |  |  | <b>12</b> | 8  | Read the literature on 12 topics. (41-43 sk.) Prepare for seminars and exercises. |
| 12. Antipsychotic drugs   | 2 |  |   | 2 |  |  | <b>4</b>  | 4  | Read the literature on 13 topics. (46 sk.) Prepare for seminars.                  |
| 13. Antidepressants   | 2 |  | 2 | 2 |  |  | <b>6</b>  | 6  | Read the literature of 14 topics. (47 sk.) Prepare for seminars and exercises.    |
| 14. Anxiolytics, etc. Insomnia treatment  | 2 |  |   | 2 |  |  | <b>4</b>  | 4  | Read the literature of 15 topics. (44 sk.) Prepare for seminars.                  |
| 15. Neurodegenerative diseases. Antiepileptic drugs   | 2 |  | 2 |   |  |  | <b>4</b>  | 4  | Read the literature of 16 topics. (40, 45 paras.) Prepare for seminars.           |
| 16. CNS stimulants, psychomimetics, addiction   | 2 |  | 2 | 2 |  |  | <b>4</b>  | 4  | Read the literature of 17 topics. (48-49 sk.) Prepare for seminars.               |
| 17. Oncological drugs   | 4 |  | 2 | 4 |  |  | <b>10</b> | 12 | Read the literature on 18 topics. (56 sk.) Prepare for seminars and exercises.    |

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|---|-----------|--|-----------|-----------|--|--|------------|------------|--|
| 18. Lifestyle medicines, medicines to treat obesity                                 | 2         |  | 2         |           |  |  | 4          | 4          | Read the literature of 19 topics. (32, 58) Prepare for seminars.                   |
| 19. Undesirable effects of drugs  | 2         |  | 2         | 4         |  |  | 8          | 6          | Read 20 topics in literature. (57 sk.) Prepare for seminars and exercises.         |
| 20. Development of new medicines, advanced therapy medicines, personalised medicine | 2         |  | 2         | 2         |  |  | 6          | 8          | Read 21 topics in literature. (11, 57, 59, 60) Prepare for seminars and exercises. |
| <b>Total</b>  | <b>32</b> |  | <b>42</b> | <b>54</b> |  |  | <b>128</b> | <b>142</b> |  |

| <b>Evaluation strategy</b>                                       | <b>Weight %</b> | <b>Time</b>         | <b>Evaluation criteria</b>  |
|--|-----------------|---------------------|---|
| Test 1   | 5               | During the semester | Answers to closed or open-ended questions are evaluated. The questions require optional answers.  |
| Test 2   | 5               | During the semester | Answers to closed or open-ended questions are evaluated. Questions require optional answers   |
| Test 3   | 5               | During the semester | Answers to closed or open-ended questions are evaluated. Questions require optional answers   |
| Test 4   | 5               | During the semester | Answers to closed or open-ended questions are evaluated. Questions require optional answers   |
| Presentation about drugs of the prescribed pharmacological group | 10              | During the semester | The student's ability to independently perform practical tasks and explain the results obtained will be assessed. The evaluation criteria are submitted to students in writing at the beginning of the semester |
| Examination  | 50              | Session             | The exam consists of 30 percent. 1/2 part of pharmacology and 70 per cent. Pharmacology Part 2/2.<br>The structure of the exam is presented during the last session.  |
| Evaluation of 1/2 part of pharmacology scores                    | 20              |                     | Pharmacology Part 1/2 scores are counted (test 1.10% + test 2.5% + test 3.5%)   |
| Final assessment   |                 |                     | The final assessment of the subject consists of the first and second part tests, the presentation assessment and the exam score, including them in the weighted values specified in the description.            |

| <b>Author</b>                | <b>Year of publication</b> | <b>Title</b> | <b>Periodical No. Is the volume of the publication</b> | <b>Place of publication and publishing house or a web link</b> |
|------------------------------|----------------------------|--------------|--|--|
| <b>Compulsory Literature</b> |                            |              |  |  |
| Rang H.P. et al.             | 2016                       | Pharmacology | 8 ed.  | Churchill Livingstone  |

|   |      |   |   |                                |
|---|------|---|---|--------------------------------|
| Katzung B.G. and Others.  | 2004 | Basic and clinical pharmacology. Edition 9.                   | Translated from Basic □ Clinical Pharmacology, 9/e by Katzung B.G., The McGraw-Hill Companies | Vilnius, Charibde, 2007        |
| Richard A. Harvey<br>Karen Whalen<br>PharmD                     | 2015 | Pharmacology  | 6 ed  | Lippincott Illustrated Reviews |
| B.G. Katzung,<br>S.B. Masters,<br>A.J. Trevor.                  | 2018 | Basic and clinical pharmacology. 11th ed.                     | 14 ed.  | McGraw Hill Medical            |
|   |      |   |   |                                |
| <b>Further reading</b>  |      |   |   |                                |
| J. Gulbinovič et al.  | 2004 | Infections and anti-infective drugs                           |   | Vilnius: "Vaistų žinios",      |
| Laurence L. Brunton,<br>Bruce A. Chabner,<br>Björn C. Knollmann | 2017 | Goodman & Gilman's The Pharmacological basis of therapeutics. | 13 ed.  | McGraw Hill Medical            |
| Vytautas Kasiulevičius,<br>Vincas Lapinskas                     | 2019 | Clinical significance of pharmacokinetic constants            |   | UAB "Vaistų žinios"            |