## 1. COURSE DESCRIPTION – GENERAL INFORMATION

<table>
<thead>
<tr>
<th>2.1. Course teacher</th>
<th>Assoc. Prof. Milena Jadrijević-Mladar Takač, PhD</th>
<th>2.1. Year of study</th>
<th>2nd</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2. Name of the course</td>
<td>Medicinal Chemistry</td>
<td>2.2. Credit value (ECTS)</td>
<td>3.5</td>
</tr>
<tr>
<td>2.12. Associate teachers</td>
<td>-</td>
<td>2.3. Type of instruction (number of hours L+E+S+e-learning)</td>
<td>30+0+0</td>
</tr>
<tr>
<td>o Study programme (undergraduate, graduate, integrated)</td>
<td>Medical biochemistry integrated study programme</td>
<td>2.4. Expected enrolment in the course</td>
<td>25</td>
</tr>
<tr>
<td>o Status of the course</td>
<td>Compulsory</td>
<td>2.5. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)</td>
<td>2nd</td>
</tr>
</tbody>
</table>

## 2. COURSE DESCRIPTION

### 2.1. Course objectives

The primary goal of Medicinal Chemistry in the integrated study of Medical Biochemistry is to introduce students with the major concepts of pharmaceutical chemistry that support research, development and clinical use of drugs, the design and the implementation of pro-drugs, from their structural and physicochemical features important for biological effects and clinical use of drugs, the relationships between chemical structure and biological activity (SAR), and also adverse drug reactions (ADR), to their impact on the diagnostics where it is appropriate, through introduction of main pharmacotherapeutic groups and their subgroups (chemistry, indications, pharmacological effects and side-effects).

### 2.2. Enrolment requirements and required entry competences for the course

Enrolment requirement: the attended Organic chemistry

### 2.3. Learning outcomes at the level of the study programme to which the course contributes

- The application of basic knowledge of pharmaceutical-chemical aspects of drugs that are in clinical use in defining, analyzing and proposing actions related to the research and implementation of new laboratory methods for detecting and monitoring diseases and effects and/or efficacy of the therapy.
- Interpretation of the results of laboratory analysis by the clinical aspects by knowing the pharmacotherapeutic groups of drugs, their classification, and the most important representatives.
- The assurance of positive interactions with patients, colleagues, health professionals and the public.

### 2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)

After completing the course students will be able to:

1. List the most important pharmacotherapeutic groups of drugs and the classification within each group;
2. Draw the chemical structure of selected drugs;
3. Explain the mechanism of action, based on knowledge of the structural features of the drug;
4. Link chemical and biochemical aspects of the drug to its pharmacological effect and side-effects;
5. List the indications of selected drugs and their side effects, and the impact of certain drugs to diagnostic tests;
6. List the main chemical aspects relevant to research, development and clinical use of drugs

2.5. Course content broken down in detail by weekly class schedule (syllabus)

- Antifungal drugs (polyene antibiotics, griseofulvin and synthetic antimycotics). Chemotherapy of protozoal diseases: Structural features and classification (indications, clinical use and side effects).

- Drugs affecting the autonomic nervous system (ANS): Drugs affecting the parasympathetic nervous system. Activators (agonists) of cholinoreceptors and inhibitors of cholinesterase. Parasympatolytics – Cholinoreceptor blockers and cholinesterase regenerators. Sympathomimetic drugs. Sympathetics Adrenoreceptor blockers, Chemistry and mechanism of action. Features of each group of drugs (indications, clinical use and side effects).
- Drugs acting on hemostasis. Hemostatic agents. Antihemorrhagic drugs. Aggregation inhibitors - Antithrombotic drugs. Anticoagulants. Indirect fibrinolitics and antifibrinolitics. Hypolipidemic agents/antilipidemic drugs - Drugs for lowering triglyceride and cholesterol levels (clofibric acid derivatives, nicotinic acid, and inhibitors of the HMG-CoA/3-hydroxy-3-methyl-glutaryl-CoA reductase). Antihistamine H1 receptor antagonists. Features of each drug, the representative in therapeutic group. Chemistry and mechanism of action (indications, clinical use and side effects).

2.6. Type of instruction

| lectures | independent study multimedia and the internet laboratory work with the mentor (other) |
| seminars and workshops exercises online in entirety mixed e-learning field work | 2.7. Comments: Optional student's contribution to teaching process: Preparation of seminar - Search the relevant literature, - Preparation of seminar abstract and ppt presentation, - Seminar topic presentation. |

2.8. Student responsibilities

Attendance to teaching process and participation in group discussions.

2.9. Screening of student's work

Class 1: Research Practical training
<table>
<thead>
<tr>
<th>(specify the proportion of ECTS credits for each activity)</th>
<th>attendance</th>
<th>Research</th>
<th>Practical training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental work</td>
<td></td>
<td>Report</td>
<td></td>
</tr>
<tr>
<td>Essay</td>
<td>Seminar essay</td>
<td>(Other—describe)</td>
<td></td>
</tr>
<tr>
<td>Tests</td>
<td>0.5</td>
<td>Oral exam</td>
<td>2 (Other—describe)</td>
</tr>
<tr>
<td>Written exam</td>
<td>Project</td>
<td>(Other—describe)</td>
<td></td>
</tr>
</tbody>
</table>

2.10. Grading and evaluation of student work over the course of instruction and at a final exam

Compulsory: class attendance, MCQ tests, oral exam. Optional: Preparation of seminar topics (seminar abstract in Word document 1A4 page, PowerPoint presentation, 15-20 slides), and the presentation of seminar topics to all students.

2.11. Required literature

Lecture handouts 2013, Medicinal chemistry, MB2-20, (M. Jadrijević-Mladar Takač)
Foye’s Principles of Medicinal Chemistry, T. L. Lemke & D. A. Williams (Eds), Lippincot Williams and Wilkins, New York, 2008

2.12. Optional literature


2.13. Methods of monitoring quality that ensure acquisition of exit competences

Outcomes 1-6 are checked by MCQ tests and by oral exam.