

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Assistant Professor Zrinka Rajić Džolić, PhD	1.6. Year of study	3 rd
1.2. Name of the course	Medicinal Chemistry 1	1.7. Credit value (ECTS)	9
1.3. Associate teachers	Professor Branka Zorc, PhD Ivana Perković, PhD Hrvoje Rimac, MPharm.	1.8. Type of instruction (number of hours L+E+S+e-learning)	45 + 60 + 7
1.4. Study programme (undergraduate, graduate, integrated)	Pharmacy integrated study programme	1.9. Expected enrolment in the course	130
1.5. Status of the course	Compulsory	1.10. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	2 nd
2. COURSE DESCRIPTION			
2.1. Course objectives	<p>For each therapeutic class described in Medicinal Chemistry 1, the student will have knowledge of:</p> <p>(1) General structural features of agents belonging to the therapeutic class</p> <p>(2) Relevant physicochemical properties</p> <p>(3) Relevant chemical reactions/synthetic pathways for selected drugs</p> <p>(4) Structural influences on mechanism of pharmacologic action (structure-activity relationship)</p> <p>(5) Structural influences on pharmacologic/toxicological/therapeutic profiles.</p> <p>The gained knowledge is the basis for the following courses: Medicinal chemistry 2, Drug Metabolism, Pharmacology and Pharmaceutical Analysis.</p>		
2.2. Enrolment requirements and required entry competences for the course	<p>Enrolment requirements: Organic Chemistry passed</p> <p>Required entry competences for the course: knowledge of Organic Chemistry</p>		
2.3. Learning outcomes at the level of the study programme to which the course contributes	<ul style="list-style-type: none"> • Knowledge of the connection between the structural features of the drugs and their physico-chemical characteristics, mechanism of action and use. • Application the gained knowledge about the therapeutic classes of drugs. • Counseling and giving information to patients about the drug action. 		
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	<p>Student will be able to:</p> <p>1. Recognize the drug structure and predict its pharmacologic action;</p>		

	<p>2. Recognize the drug physico-chemical and stereochemical features;</p> <p>3. Determine the pharmacophore;</p> <p>4. Describe the mechanism of action, use and mode of application of the selected drugs on the basis of their structure;</p> <p>5. Describe and perform synthesis of the drugs and determine the reaction yield.</p>
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>LECTURES:</p> <ul style="list-style-type: none"> • Introduction to Medicinal Chemistry. • New drugs development • Antiseptics and Desinfectants • Diagnostic agents • Acidotic and alkalotic agents • Drugs acting on gastrointestinal tract (Digestives; Antiflatulent agents; Adsorbent agents, Antidiarrhoic agents; Laxatives; Acids, Antacids, Anti-ulcer agents – H_2 antagonists and proton pump inhibitors) • Anticancer agents (Introduction, Drugs acting directly on nucleic acids; Drugs acting on enzymes: antimetabolites; Hormone-based therapies; Drugs acting on structural proteins; Inhibitors of signalling pathways; Miscellaneous enzyme inhibitors; Miscellaneous anticancer agents; Photodynamic therapy) • immunomodulatory drugs • Antibodies • Drugs for the treatment of rheumatoid arthritis • Drugs for the treatment of gout • Drugs for the treatment of multiple sclerosis • Antiviral agents (Introduction, Antiviral agents which act against DNA viruses; Antiviral agents which act against RNA viruses: HIV, flu virus and hepatitis C; Miscellaneous agents) • Antimicrobial agents and antibiotics – introduction • Antimicrobial agents (Quinolones and fluoroquinolones; Nitroheteroaromatic agents; Sulphonamides, Metenamine) • Antibiotics (β-lactam antibiotics; penicillins; cephalosporins, β-lactamase inhibitors, oxacephems, carbapenems, monobactams; Different antibiotics which inhibit cell wall synthesis; Antibiotics which act on the plasma membrane structure; Antibiotics which inhibit protein synthesis; Miscellaneous antibiotics) • Antimycobacterial agents • Antifungal agents • Antiparasitic agents (antiprotozoal agents, anthelmintics, scabicides and pediculocides) • Inorganic agents (potassium, zinc, iron and magnesium salts) • Calcium salts and bisphosphonates <p>SEMINARS:</p> <ul style="list-style-type: none"> • Chiral drugs • Drug synthesis: stoichiometry and the reaction mechanisms • Development of H_2 antagonists as anti-ulcer drugs

	LABORATORY EERCISES: <ul style="list-style-type: none">• Acetylsalicylic acid• Benzocaine• Phenytoin• Caffeine• Hydrochlorothiazide• Bismuth subgallate• Sodium chloride• Calcium carbonate• Azithromycine• Dicumarol• Nicotinamide• Diethyl ether• Stereochemistry• Ascorbic acid• Quinine					
2.6. Type of instruction	lectures seminars and workshops exercises online in entirety mixed e-learning field work		independent study multimedia and the internet laboratory work with the mentor (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening of student's work (specify the proportion of ECTS credits for each activity)	Class attendance	2.5	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay		(Other--describe)	
	Tests	0.5	Oral exam	3	(Other—describe)	
	Written exam	3	Project		(Other—describe)	
2.10. Grading and evaluation of student work over the course of instruction and at a final exam	After the laboratory exercises students the test. The passed test is the condition to take the written exam. The passed written exam is the condition to take the oral exam.					
2.11. Required literature (available at the library and via other media)	Title					
2.12. Optional literature	1. Thomas L. Lemke, David A. Williams, Victoria F. Roche, S. William Zito, Foye's Principles of Medicinal Chemistry, 7th Ed.,Lippincott Williams & Wilkins, 2012 (30 copies in the library). 2. Graham L. Patrick, "An Introduction to Medicinal Chemistry", 5th Ed. Oxford University Press 2013.					
2.13. Methods of monitoring quality	Learning outcomes 1-4 are checked by the written and oral exam, while learning outcome 5 is checked by the test after					

that ensure acquisition of exit competences	the laboratory exercises.
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