Name of the discipline	**Medicinal chemistry**			
Type	compulsory		Credits	4
Year of study	V		semester	IX, X
Number of hours	course	27	Practical/laboratory work	42
	SEMINARS		Individual work	51
compound	Specialized			
Course holder	PhD in Pharmaceutical Sciences, Associate Professor Uncu Livia			
location	Malina Mica, 66			
Prerequisites and requirements of:	Program: knowledge of organic chemistry, biological chemistry, pharmaceutical chemistry, pharmacology, toxicology, pharmacognosy, physiology, physiopathology, molecular biology, microbiology, pharmaceutical technology, biopharmacy.			
	Competencies: Knowledge of chemical structures; physiological and pathological processes in the human body; biochemical processes and biochemistry of xenobiotics; structure and methods of drug synthesis, physicochemical properties, analysis methods; mechanisms of drug action and pharmacotherapeutic applications; notions of toxicokinetics and toxicodynamics; compounds of natural origin and their properties; structure of cells, membrane tissues; characterization of pathogenic microorganisms; pharmaceutical forms and excipients; notions of biotransformation and pharmacokinetic processes.			
The mission of the discipline	Medical chemistry is intended to integrate the knowledge acquired in the basic specialties. The discipline connects medical, chemical and pharmaceutical concepts to create a unique and clearer picture of the drug-human organism interaction. This knowledge is indispensable for providing quality pharmaceutical care and for monitoring therapeutic errors that may have a negative impact on the patient's health. The mission of the discipline is to provide students with knowledge of the concepts of medical chemistry, as well as develop the skills to understand the processes and methods of rational drug design, which will ensure their effectiveness and harmlessness for quality pharmaceutical care of patients.			
The topic presented	Basic stages of rational drug discovery and construction. Drug action targets; biological membranes. Drug-receptor interactions, interaction kinetics, basic theories of ligand reception. Ion channels. Enzymes; principles of action and regulatory activity. Kinetics of fermentative reactions. Nucleic acids as targets for biologically active substances. Relationships between the physicochemical properties of the active principle and its pharmacological action. Solubility and lipophilicity, ionization of drug molecules. Chemical bonds and biological activity of molecules. Stereochemical aspects of drugs. Isosterism and bioisosterism. Drug design. QSAR, the main stages of drug design. Total screening. Molecular modeling in drug design. Ligand design. Double drugs. Natural compounds as lead products for the design of new drugs. Structural concepts in predicting the toxicity of drug preparations. Principles of bioavailability and bioequivalence of drugs. Optimization of bioavailability. Bioequivalence studies. Biotransformation of drugs and physicochemical properties of drug substances. Influence of the structure of the drug substance on the degree of absorption and metabolism. Pro-drugs and bioprecursors. Structural modifications			

	after the addition of hydroxy-, mercapto-, carboxy-, amino-, carbonyl groups. Cyclization of linear analogues under the conditions of the organism. Biological drugs. Features of obtaining and control. Hormonal and fermentative biological preparations. Blood and blood-derived products. Vaccines. Immunoprophylaxis and immunotherapy. Immunoglobulins, monoclonal antibodies. Gonadotropins, bifidobacteria. Biological role, methods of obtaining, pharmaceutical products. Drug interactions, classification, mechanisms. Drug-drug interactions, drug-food, food supplements, alcohol, tobacco interactions.
Study purposes	• to know *general* methods and procedures for rational drug design, factors influencing drug action, biological drugs; • to know the principles of drug interaction with the human body for the successful performance of professional responsibilities; • be able to identify and avoid the main types of errors frequently encountered during medication treatment; • to propose and provide complex and well-argued qualitative pharmaceutical assistance; • to apply methods for determining bioavailability, solubility, bioequivalence in professional activity; • To detect and help rule out drug interactions that may have a negative impact on the patient's health.
Purchased practical skills	• Identification of pharmacophore groups in the structure of drugs; • Correlation of various structures with the pharmacological activity of drug molecules; • Determining the degree of influence of the physicochemical properties of drugs on their activity; • Identification of chiral centers, steric properties of drug molecules; • Determining the lipophilicity of molecules based on their chemical structure; • Knowledge of methods for modifying chemical structures to optimize the bioavailability of medicinal substances; • Determination of ionization, biotransformation processes (degree of absorption, metabolism, distribution, excretion) and the factors that influence these processes; • Rational drug design, methods, particularities, QSAR techniques; • Ligand design based on lead compounds; • Toxicity prediction based on chemical structures with the application of mathematical methods; • Knowledge of biological medicines and their methods of obtaining through biotechnology; • Identification, molecular explanation and monitoring of drug interactions.
Evaluation form	Exam at the end of each semester (2 exams)