<table>
<tr><td>Name of discipline</td><td colspan="4">Physical Chemistry</td></tr>
<tr><td>Type</td><td colspan="2">Compulsory</td><td>Credits</td><td>5</td></tr>
<tr><td>Academic year</td><td colspan="2">II</td><td>Semester</td><td>III</td></tr>
<tr><td rowspan="2">Number of hours</td><td>Course</td><td>15</td><td>Practice/laboratory work</td><td>45</td></tr>
<tr><td>Seminar</td><td></td><td>Self-training</td><td>90</td></tr>
<tr><td>Component</td><td colspan="4">Fundamental</td></tr>
<tr><td>Course holder</td><td colspan="4">Mirzac Viorica, lecturer</td></tr>
<tr><td>Location</td><td colspan="4">Chișinău, 66 Malina Mică street, building 2.</td></tr>
<tr><td rowspan="2">Conditionings and prerequisites of:</td><td colspan="4">Program: basic knowledge in related disciplines such as chemistry, physics, mathematics, biology</td></tr>
<tr><td colspan="4">Competences: digital abilities (use of Internet, document processing, electronic tables and presentations, use of graphic programs); ability to communicate and team work;</td></tr>
<tr><td>Mission of the discipline</td><td colspan="4">Physical chemistry is a fundamental discipline for the formation of future pharmacists, the acquired knowledge being necessary for understanding the physicochemical mechanisms present in the process of preparation and analysis of pharmaceutical forms. The physical chemistry course has the purpose of forming the theoretical knowledge in the field of physical chemistry, the accumulation of practical skills and their application to the study of FCMA and pharmaceutical chemistry, pharmaceutical technology, pharmacology and clinical pharmacy. The acquired knowledge allows the future ability to measure and control the physicochemical properties of drugs.</td></tr>
<tr><td>Overview of the topics</td><td colspan="4">The basics of chemical thermodynamics.
Thermodynamic conditions of steady state.
Transformations and phase equilibrium.
Colligative properties of electrolyte and non-electrolyte solutions.
Electrical conductivity of electrolyte solutions.
Electrode potential and electromotive force of galvanic cells.
Kinetics of chemical reactions.</td></tr>
<tr><td>Outcomes</td><td colspan="4">• to define the thermodynamic system, state parameters, energy functions, caloric capacities;
• to know the basic principles of thermodynamics, the fundamental laws of chemical and biochemical equilibrium;
• to demonstrate the relationship between energy functions and their relationship with predicting the possibility, spontaneity and direction of chemical and physical processes;
• to define the phase, component, degrees of freedom, phase diagrams, ideal solution, extraction, cryoscopy, ebullioscopy, ionization degree, osmosis, absolute ion velocity;
• to know the Gibbs’ phase law, the Raoult's law, the Conovalov's rules, the Nernst distribution law, the Ostwald dilution law;</td></tr>
</table>

	• to know and analyse the phase diagrams of various drug mixtures; • to define the relationship between the colligative properties of the solutions; • to define the electrode, galvanic element, standard potential, potentiometric titration, titration curve, reaction rate, molecularity and reaction order, half-life, activation energy; • to know the types of electrodes and their use, methods of determining reaction order and activation energy; • to make a galvanic element for pH determination and to perform potentiometric titration, determination of concentrations of strong acids and bases, determination of ionization constants of weak acids and weak bases; • to demonstrate the relationship between emf and the activity of ions in the solution; • to apply kinetic data to determine the half-life and shelf-life of drugs; • to understand how the catalyst influences the activation energy;
Practical skills	• the use of thermodynamic research in biochemistry and medicine for the correct processing of the conditions for the synthesis of drug substances. • to apply the knowledge of the thermodynamic parameters and the thermal effects to correct processing of the conditions for synthesis of the drugs; • to use thermodynamic knowledge to compare the energy of healthy and diseased cells that enables the study of different pathological processes and to develop diagnostic methods. • to apply the theoretical knowledge to the calculation of the extracted and remained masses in the unitary and multiple extractions; • to plot the phase diagram of the binary system and perform its analysis to determine the critical solubility temperatures, the solubility limits and the determination of the concentrations of the mixtures and the conditions for their storage; • to know the colligative properties of non-electrolyte and electrolyte solutions and to determine the osmotic concentration of drug substances in solutions, the isotonic coefficient, the degree of dissociation. • to apply kinetic data to determine the half-life and shelf-life of drugs; • to integrate information about oxidation and reduction cells in the study of biological oxidation processes;
Evaluation form	Exam