



RIGA TECHNICAL
UNIVERSITY

Faculty of Materials Science and Applied Chemistry

Study programme "Chemical Technology"

Note! This is a preliminary list of courses. Changes may occur!

AUTUMN SEMESTER

BACHELOR COURSES

Code	Course name	CP	ECTS
<u>KNF301</u>	Physical Chemistry (advanced course)	6.00 CP	9.00 ECTS
<p>Electrochemistry. Theory of electrolytic dissociation. Theory of strong electrolytes. Debye-Huckel theory. Conductivity of electrolytes. Galvanic cells. Electromotive forces and electrode potentials. Types of galvanic cells. Thermodynamics of galvanic cells. Types of electrodes. Electromotive force measurement. Electrochemical kinetics. Electrolysis. Metal corrosion. Kinetics of chemical reactions. Formal kinetics. Reaction rate. Reaction Rate Law. Reaction Order Determination. Fundamentals of Chemical kinetic theories. Hard-Sphere collision theory. Activation energy. Arrhenius equation. Transition-state theory. Chain reaction. Catalysis. Homogeneous catalysis. . Fundamentals of heterogeneous catalysis.</p>			
<u>KOK315</u>	Nuclear Magnetic Resonance Spectroscopy	3.00 CP	4.5 ECTS
<p>Nuclear magnetic resonance phenomenon. ¹H and ¹³C-NMR. Spectral characteristics. Influence of structural factors on chemical shifts and spin-spin coupling constants. Interpretation of spin-spin coupling in first order spectra. Double resonance. Dynamic NMR. Exchange processes. Application of NMR spectroscopy to the determination of the structure of organic compounds, as well as equilibrium and rate constants of chemical reactions.</p>			
<u>KVT312</u>	Chemical Process Modeling	3.00 CP	4.5 ECTS
<p>Basics of simulation. Principles of algorithmization. Numerical methods. Residence time distribution. Material and heat balances for steady and non-steady state processes. Sources and sinks. Flow sheeting basics.</p>			
<u>KVT310</u>	Chemical Reaction Engineering	3.00 CP	4.5 ECTS
<p>The study course gives insight on the division of chemical processes and the respective reactors. Homogeneous chemical processes, their reactors and calculations. Heterogeneous non-catalytic processes in chemical systems gas (liquid) – solid and principled schemes of their reactors. Heterogeneous non-catalytic chemical processes in system gas (liquid) – liquid and their reactors. Heterogeneous catalytic processes and reactors, their calculations.</p>			
<u>KVK360</u>	Chromatography	2.00 CP	3.00 ECTS
<p>Solvent extraction, chromatography, types of chromatography, planar chromatography, gas chromatography, sample preparation, calculation of the results.</p>			
<u>KTF302</u>	Chemistry Informatics	2.00 CP	3.00 ECTS
<p>Classification of information sources. Handbooks of chemistry and information resources (Referativnyi Zhurnal Khimiya, Chemical Abstracts). Scientific data bases (Science Direct, Scopus, Mendeley). Chemistry databases (Reaxys, SciFinder). Patents' information. Work with literature: information retrieval, systematization, writing of publication, processing of text, formulas, diagrams, pictures. Office applications: word processor Word, data processor Excel, presentation tool PowerPoint, chemical drawing programs.</p>			
<u>KVT723</u>	Fluid Flow, Heat and Mass Transfer	5.00 CP	7.5 ECTS
<p>In this course, attention is paid to the following topics: classification of chemical technology processes, basic principles of process analysis and measurement. Introduction into similarity theory. Hydraulic processes. Hydrostatics, hydromechanics. Euler's differential equations, Bernoulli equations. Hydraulic resistances. Hydraulic machines: pumps, ventilators, compressors. Outflow. Hydromechanics of suspended layer. Heat processes. Heat management. Heat exchange in convection. Heat shining. Heat transition processes, heat exchange devices. Mass exchange processes. Mass exchange processes in static. Mass exchange processes in kinetics, molecular and convective diffusion. Mass</p>			

yields, mass transition processes. Main principles of mass exchange devices' measurements

Note! Full course description available by clicking on the course code!

