
		UNIVERSITY OF EAST SARAJEVO Faculty of Technology Zvornik					
		Study program: Chemical Engineering and Technology					
		CYCLE I		YEAR IV			
Course title		PROCESS AND PLANT DESIGN					
Department		Department for Process Engineering-Faculty of Technology Zvornik					
Course code		Course status		Semester		ECTS	
		Obligatory		VIII		7	
Teacher		Mitar Perusic, PhD, full professor					
Teaching assistant		Dusko Kostic, MSc, teaching assistant					
Teaching workload/Number of hours (weekly)			Individual work (hours per semester)			Student's work coefficient, S ₀	
Lectures	Auditory exercises	Laboratory Exercises	Lectures	Auditory exercises	Laboratory Exercises	S ₀	
3	1	2	60	20	40	1,33	
3*15 + 2*15 + 0*15 = 90			3*15*1.40 + 2*15*1.40 + 0*15*1.40 = 120				
Total course workload (hours per semester, teacher + student): 90+ 120 = 210							
Learning outcomes		After finishing the course, students will be able to: <ol style="list-style-type: none"> recognize the role of technology engineers in the design of processes and plants connect the matter and energy balance with the calculation of the dimensions of the basic process equipment, investment and production costs produce process schemes and simulate them in the software package demonstrate and utilize the knowledge of the preparation of project documentation based on the terms of reference according to technical standards (preliminary or basic design). 					
Prerequisites		None.					
Teaching methods		Lectures, class exercises and individual work					
Syllabus outline per week		<ol style="list-style-type: none"> Introductory lecture: concept of design, design levels, design areas, design structures. Characteristics of the process industry: structure, development, characteristics. Trends in the development of chemical technology. Factors of development. Development and design. Development of process steps. Typical design problems. Techno-economic projects: investment activity, prior study of possibilities and justification, specialist studies, feasibility study or investment program. The effects of investment. Process and plant assessment. Investment costs: description and structure. Estimating investment costs. Inflation indices. Methods of estimating investment costs. Estimation of purchase prices of process equipment. Production costs: definition, description, division. Production costs. Variable production costs. Examples of production cost calculations. the financial impact of investments. Project task: definition, description, problem project task, detailed project task. Elements of the project task. Systematics and analysis of previously crossed material. Process design: concept, algorithm of steps in design. Data sources. The accuracy of engineering calculations. Assessment of physical and chemical properties. Process schemes, BFD-block scheme, PFD-scheme of process steps, PID-scheme of pipelines and instrumentation. Standards when drawing process schemes. Synthesis and optimization of process schemes. Simulation of process schemes: definition, fundamental concepts, stoichiometry, physical quantities and units, process parameters, process variables. Balances of matter and energy: mathematical formulation of problems, material balance, energy balance. Optimization. Pipelines and instrumentation. Process security. Construction materials. Preliminary plant schedule. Sizing process equipment: reactors, gravity and equilibrium separators, columns with floors. Columns with fillers. Heat exchangers; classification of TEMA standards, dimensioning and rules for exchangers. Pumps and compressors. Tanks. Mixers. Contactors. Transport and fluidized layer. Other appliances Detailed design. Auxiliary means and facilities. 					

	15. Systematics and analysis of previously exceeded construction.			
	Mid-term tests are taken after the 8th week and the 15th week. Semester verification is required after the 15th week.			
Obligatory literature				
Author/s	Title, publisher	Year	Page	
M. Jovanovic	Basics of technological design, SHTS, Belgrade	2004	3-95	
F.Shef, Z. Olujic	Design of process plants, SKTH Chemistry in Industry, Zagreb	1988	77-463	
R. Sinnot, G. Towler	Chemical Engineering Design, 5 th Edition, Elsevier, Amsterdam	2009	52-1055	
E. Beer	Manual for sizing chemical industry devices, HDKI, Zagreb	1994	1-495	
Additional reading				
Author/s	Title, publisher	Year	Page	
Obligations, assessment methods and grading system	Type of student evaluation		Points	Percentage
	Pre-exam obligation			
	Attendance		6	6 %
	Mid-term test I		27	27%
	Mid-term test II		27	25 %
	Lab exams		10	10 %
	Final exam			
	Final exam		30	30 %
TOTAL		100	100 %	
Web page	www.tfzv.ues.rs.ba			
Date	2023			