Course Unit Descriptor

Study Programme: Energy and Process Engineering			
Course Unit Title: Fundamentals of Process Engineering			
Course Unit Code: M3303			
Name of Lecturer(s): Damir Đaković, Dunja Sokolović			
Type and Level of Studies: Bachelor level			
Course Status (compulsory/elective): compulsory			
Semester (winter/summer): winter			
Language of instruction:english			
Mode of course unit delivery (face-to-face/distance learning): face-to-face			
Number of ECTS Allocated:5			
Prerequisites: none			
Course Aims: Introduction to the basic concepts and methods of problem solution in the field of process engineering, as well as with the applications to the specific processes and plants.			
Learning Outcomes: Knowledge gain about methods of process operations analysis, as well as about application possibilities of process operations within industrial plants in various branches of industry			
Syllabus: Determination and interpretation of Process Engineering (definition determination and and characterization of PE, examples, classifications and divisions, task and roles of the Mechanical Engineering profession, necessary foundations for dealing with PE). Basic concepts and definitions in PE (working and auxiliary mediums, multicomponent substances, concentration, apparatus-process units, technological relations, processing concept in PE). Basic process operations (operations without additional mediums, operations with additional mediums, complex process operations). Concept of equilibrium and transfer phenomena in multicomponent heterogeneous environments (equilibrium conditions, different ways of expression of transfer potential expression, fluxes, convective transfer). Application of sustainable principles in multicomponent environments – balance methods (general derivation of transfer equations and macro balance equations, balance procedures). Fluid mechanics of multiphase systems as a basis of PE. Thermodynamics of mixtures as a basis of PE. Theory of diffusional mass transfer as a basis of PE. Chemical kinetics and PE. Similarity theory, modeling and simulation in PE. Efficiency of process operations and systems. Application of numerical technique and computers in PT. Monitoring, regulation and management of process plants. Economics of process systems. Methods and procedures of optimization in PT. Methods of energy integration. Process databases and calculations. Process plants and environment.			
Required Reading: Relevant literature in English TBD			
Weekly Contact Hours:5	**Lectures:3**	**Practical work:2**	
Teaching Methods: Lectures, computing and cuditory exercises, consultation. The course grade is formed based according to the success at the computing exercises and examination. Alternatively, the examination can be taken through two colloquiums. If a student passes both colloquiums, (s)he does not take the examination.			
Knowledge Assessment (maximum of 100 points):100			
Pre-exam obligations	points	**Final exam**	points

Lecture attendance	5	Written part of the exam-tasks and theory	30
Exercise attendance	5	Written part of the exam-tasks and theory	20
Test	10	Written part of the exam-tasks and theory	20
Test	10		
Colloquim exam	20		
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The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			