

Faculty of Metallurgy and Technology / ENVIROMENTAL PROTECTION / INDUSTRIAL ECOLOGY

Course:	INDUSTRIAL ECOLOGY			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
12313	Mandatory	3	7	2+2+0
Programs	ENVIROMENTAL PROTECTION			
Prerequisites	No mutual dependency			
Aims	Getting familiar with the wide spectrum of industrial activities, the possibilities of their modification and their environmental impact. This course enables development of critical and creative thinking as well as alternative standpoint in all environmental aspects			
Learning outcomes	After completion of the course, student should: 1. Know the characteristics and sources of principal wastes 2. Recognises technological interventions aimed to create cyclic technological processes 3. Estimates the possibility of reduction of emissions and wastes 4. participate in eco-design implementation 5. Use the adequate methods for the assessment of Life cycle of products			
Lecturer / Teaching assistant	Prof. dr Mira Vukčević			
Methodology	lectures, interactive exercises, on-site exercises, students written essay			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction in industrial ecology , definition, historical overview of the term			
I week exercises	Consideration of the examples and principles, themes for the students essay			
II week lectures	The aims of industrial ecology			
II week exercises	Implementation of the industrial ecologys principles worldwide			
III week lectures	Material and energy flow, "industrial metabolism"			
III week exercises	Examples of calculations with received data			
IV week lectures	LCA , Life cycle assessment/analysis			
IV week exercises	Analysis of LCA methodology with different software			
V week lectures	Linear and cyclic industrial processes, connections, transformation			
V week exercises	Cyclic transformation through the technological interventions, examples			
VI week lectures	Correlation between industrial systems and natural systems, reduction of raw materials, emissions, waste, metabolic diagrams			
VI week exercises	Development of metabolic diagram with prepared data			
VII week lectures	1.st Colloquium			
VII week exercises	Correctional 1.st Colloquium			
VIII week lectures	Criteria of the environmental resemblance of the product			
VIII week exercises	The best practice examples			
IX week lectures	Circular design			
IX week exercises	Circular designs principles applied on the chosen product			
X week lectures	Technological interventions and environmental impact			
X week exercises	On site exercise			
XI week lectures	Technological innovative parks			
XI week exercises	Examples			
XII week lectures	Industrial symbiosis			
XII week exercises	Examples			
XIII week lectures	development of green technologies			
XIII week exercises	Examples with pre-prepared data			
XIV week lectures	2 nd Colloquium			

XIV week exercises	Corrective 2nd colloquium					
XV week lectures	Public discussion on students essay					
XV week exercises						
Student workload						
Per week	Per semester					
7 credits x 40/30=9 hours and 20 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises 5 hour(s) i 20 minuts of independent work, including consultations	Classes and final exam: 9 hour(s) i 20 minuts x 16 =149 hour(s) i 20 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 9 hour(s) i 20 minuts x 2 =18 hour(s) i 40 minuts Total workload for the subject: 7 x 30=210 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 42 hour(s) i 0 minuts Workload structure: 149 hour(s) i 20 minuts (courses), 18 hour(s) i 40 minuts (preparation), 42 hour(s) i 0 minuts (additional work)					
Student obligations	Regular follow of the lectures and exercises, active participation during semester. essay					
Consultations	Wednesday from 11-12a.m					
Literature	1 .D.J. richards (ed), National academy press, Washington DC, USA 81997), ISBN 0-309-05294-7 2. S. Suh (ed) handbook of Input-Output Economics in Industrial Ecology, Springer 82009), ISBN 978-1-4020-6154-7					
Examination methods	essay, colloquia, written final exam					
Special remarks	-					
Comment	-					
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points