

Faculty of Metallurgy and Technology / ENVIRONMENTAL PROTECTION / ENVIRONMENTAL CHEMISTRY (SELECTED CHAPTERS)

Course:	ENVIRONMENTAL CHEMISTRY (SELECTED CHAPTERS)			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
12302	Mandatory	1	8	3+0+2
Programs	ENVIRONMENTAL PROTECTION			
Prerequisites	There is no requirement to register and listen to the case.			
Aims	Students gain knowledge about pollutants, their interaction with the environment and their negative effects that they can cause in ecosystems.			
Learning outcomes	The student should: - Knows substances of anthropogenic origin in the environment - Explains the course and processes that cause the formation and distribution of pollutants/contaminants in life the environment as well as their properties and transformations - Classify the basic groups of inorganic and organic contaminants. - Compares the basic types of pollutants/contaminants by their properties, structure and their toxicity to plants and the animal world, man and the environment - Integrates the acquired theoretical and experimental knowledge in the direction of environmental protection and man from contaminants/contaminants - Plans a strategy to protect the environment and man from potential accidental situations - Recommends experimental techniques for monitoring important pollutants/contaminants - Demonstrates basic laboratory and teamwork skills			
Lecturer / Teaching assistant	Prof. Dr Željko Jaćimović, Msc Mia Stanković			
Methodology	Lectures, exercises, colloquiums, consultations . Students have special preparatory appointments for taking colloquiums and exams.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Getting acquainted with the subject and sharing information about the subject. Chapter processing: Substance of anthropogenic origin in the environment.			
I week exercises	Analysis of samples of anthropogenic origin			
II week lectures	The course and processes that cause the formation and distribution of pollutants in the atmosphere.			
II week exercises	The course and processes that cause the formation and distribution of pollutants in the atmosphere			
III week lectures	Properties and chemical transformations of pollutants in the environment.			
III week exercises	Physico-chemical properties of selected pollutants			
IV week lectures	Sulfur and nitrogen oxides, ozone, fluorides, carbon(II)-oxide, nitrogen(I)-oxide, methane, halogen hydrocarbons. Classification of pollutants by environmental impact			
IV week exercises	Physico-chemical properties of selected pollutants			
V week lectures	Effects due to their deposition (vegetation damage, corrosion of metals, damage to industrial properties and installations, climate change, deterioration of the quality of fresh waters, land, sea, forest damage, etc. Health of man.			
V week exercises	Calculation			
VI week lectures	Chemicals that pollute the soil			
VI week exercises	Testing of samples of selected chemicals that pollute the soil			
VII week lectures	Micropollutants of organic origin in waters. Adsorption, sorption, distribution.			
VII week exercises	Micropollutants of organic origin in waters.			
VIII week lectures	Organic acids and bases. Bioaccumulation. Transformation processes: oxidation and reduction, photolysis, hydrolysis, biodegradation.			
VIII week exercises	Organic acids and bases.			
IX week lectures	Polychlorinated biphenyls and chlorinated insecticides. Carbamates and organophosphorus insecticides.			
IX week exercises	Determination of residues of polychlorinated biphenyls and chlorinated insecticides			
X week lectures	Herbicides. Phenols. Halogenated aliphatic and monocyclic aromatic hydrocarbons			
X week exercises	Determination of herbicides residues			

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XI week lectures	Phtalate esters. Polychlorinated benzo-p-dioxins					
XI week exercises	Determination of selected polychlorovanidinsbenzo-p-dioxins					
XII week lectures	Polycyclic aromatic hydrocarbons					
XII week exercises	Determination of polycyclic aromatic hydrocarbons.COLLOQUIUM					
XIII week lectures	Heavy metals					
XIII week exercises	Results and analysis of colloquiums					
XIV week lectures	Biological contaminants. Radiological contaminants					
XIV week exercises	REMEDIAL COLLOQUIUM					
XV week lectures	Consultations, answers to students questions and preparation for the exam					
XV week exercises	Results and analysis of colloquiums					
Student workload	Per week 5 credits x 40/30 = 6hours 40 minutes Structure: - 3 hours of lectures; - 2 hours of laboratory exercises; Teaching and final exam: 6 hours 40 min x 16 = 106 hours 40 min Necessary preparations (administration, enrollment, certification before the beginning of the semester 6 hours 40min x 2 = 13 hours 20 min Total load for the item: 5 x 30 = 150 hours Preparing for the remedial exam and passing the examthe remaining time of the first two items is 30 hours. Load structure: 106 hours 40 min (classes) + 13 hours 20 min (preparation) + 30 hours (supplementary work). Other activities, including consultations. 1 hour 20 minutes In the semester Teaching and final exam: 6 hours 40 min x 16 = 106 hours 40 min Necessary preparations (administration, enrollment, certification before the beginning of the semester 6 hours 40min x 2 = 13 hours 20 min Total load for the item: 5 x 30 = 150 hours Preparing for the remedial exam and passing the examthe remaining time of the first two items is 30 hours. Load structure: 106 hours 40 min (classes) + 13 hours 20 min (preparation) + 30 hours					
Per week			Per semester			
8 credits x 40/30=10 hours and 40 minuts 3 sat(a) theoretical classes 2 sat(a) practical classes 0 excercises 5 hour(s) i 40 minuts of independent work, including consultations			Classes and final exam: 10 hour(s) i 40 minuts x 16 =170 hour(s) i 40 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 10 hour(s) i 40 minuts x 2 =21 hour(s) i 20 minuts Total workload for the subject: 8 x 30=240 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) 48 hour(s) i 0 minuts Workload structure: 170 hour(s) i 40 minuts (cources), 21 hour(s) i 20 minuts (preparation), 48 hour(s) i 0 minuts (additional work)			
Student obligations			Attendance at lectures, laboratory and field exercises is mandatory.			
Consultations			Prof.dr Željko Jačimović - Wednesday from 10-12h MSc Mia Stanković - terms after lab exercises			
Literature			1. Abdullah, M.J., Ringstad, O. And Kveseth, N.J. (1982): Polychlorinated biphenyls in the Sediments of the Inner Oslofjord: Water, Air and Soil Pollution. 2. Vukasin D. Radmilović, "Carcinogenic in the working and environmental environment", IP Velašta, Belgrade 2002.			
Examination methods			Forms of knowledge testing and assessment: Activity during the lecture: (0 - 5 points), Activity on exercises and submit reports : (0 - 5 points), And the colloquium: (0 - 20 points), II colloquium : (0 - 20 points), Final exam: (0 - 50 points), A passing grade is obtained if a student cumulatively collects at least 50 points			
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