

Faculty of Civil Engineering / INFRASTRUCTURES / WATER PURIFICATION

Course:	WATER PURIFICATION			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
11959	Mandatory	3	5	2+1+1
Programs	INFRASTRUCTURES			
Prerequisites	There is no conditionality.			
Aims	Introduction to the principles of drinking water treatment, as well as the treatment of wastewater that arises from the use of water in households, industries, and atmospheric water.			
Learning outcomes	After passing the exam in this subject, students will be able to participate independently in the design, implementation, and maintenance of drinking water treatment systems and wastewater treatment as a member of a multidisciplinary team working on such projects.			
Lecturer / Teaching assistant	Dr Goran Sekulić			
Methodology	The course includes lectures, exercises, graphical work, field trips, and colloquiums.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction, an overview of water treatment and available technologies.			
I week exercises	Introduction, an overview of water treatment and available technologies.			
II week lectures	Water quality for drinking - sanitary, aesthetic, and technical aspects.			
II week exercises	Water quality for drinking - sanitary, aesthetic, and technical aspects.			
III week lectures	Selection of the drinking water treatment process. Sampling for analysis.			
III week exercises	Selection of the drinking water treatment process. Sampling for analysis.			
IV week lectures	Overview of individual processes for drinking water treatment.			
IV week exercises	Overview of individual processes for drinking water treatment.			
V week lectures	Drinking water treatment plant: plant facilities, functional and hydraulic design of facilities.			
V week exercises	Drinking water treatment plant: plant facilities, functional and hydraulic design of facilities.			
VI week lectures	Supporting facilities and equipment of the treatment plant, and plant disposition.			
VI week exercises	Supporting facilities and equipment of the treatment plant, and plant disposition.			
VII week lectures	Hydraulic calculations and hydraulic profile of the treatment plant.			
VII week exercises	Hydraulic calculations and hydraulic profile of the treatment plant.			
VIII week lectures	Colloquium 1			
VIII week exercises	Colloquium 1			
IX week lectures	Methods for assessing the quality of wastewater of different origins.			
IX week exercises	Methods for assessing the quality of wastewater of different origins.			
X week lectures	Methods of wastewater treatment. Functional and hydraulic design of facilities and the treatment plant as a whole.			
X week exercises	Methods of wastewater treatment. Functional and hydraulic design of facilities and the treatment plant as a whole.			
XI week lectures	Methods of wastewater treatment (physical-chemical, chemical, biological). Wastewater treatment processes (primary, secondary, and tertiary treatment).			
XI week exercises	Methods of wastewater treatment (physical-chemical, chemical, biological). Wastewater treatment processes (primary, secondary, and tertiary treatment).			
XII week lectures	Primjenjivani uređaji u sklopu postrojenja.			
XII week exercises	Primjenjivani uređaji u sklopu postrojenja.			
XIII week lectures	Treatment of sludge from wastewater treatment plants.			
XIII week exercises	Treatment of sludge from wastewater treatment plants.			

XIV week lectures	Mathematical modeling of hydraulic processes in wastewater treatment plants and wastewater receiving bodies.
XIV week exercises	Mathematical modeling of hydraulic processes in wastewater treatment plants and wastewater receiving bodies.
XV week lectures	Colloquium 2
XV week exercises	Colloquium 2
Student workload	The weekly workload of 5 credits $\times 40/30 = 6.67$ hours. Structure: 1 hour of lectures and 3 hours of exercises. 2.67 hours of individual work, including consultations. During the semester: Teaching and final exam $(6.67 \text{ hours}) \times 16 = 106.67$ hours. Necessary preparations before the start of the semester (administration, enrollment, verification) $2 \times (6.67 \text{ hours}) = 13.33$ hours. The total workload for the course $5 \times 30 = 150$ hours. Additional work for exam preparation in the retake exam period, including retaking the exam, from 0 to 30 hours (remaining time from the first two items to the total workload of 150 hours for the course). Workload structure: 106.67 hours (Teaching) + 13.33 hours (Preparation) + 30 hours (Additional work)
Per week	Per semester
5 credits $\times 40/30 = 6$ hours and 40 minuts 2 sat(a) theoretical classes 1 sat(a) practical classes 1 excercises 2 hour(s) i 40 minuts of independent work, including consultations	Classes and final exam: 6 hour(s) i 40 minuts $\times 16 = 106$ hour(s) i 40 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 6 hour(s) i 40 minuts $\times 2 = 13$ hour(s) i 20 minuts Total workload for the subject: 5 $\times$ 30 = 150 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) 30 hour(s) i 0 minuts Workload structure: 106 hour(s) i 40 minuts (courses), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)
Student obligations	Attendance at lectures and exercises, completion of graphical assignments, passing colloquiums.
Consultations	
Literature	Primary literature: 1. G. Sekulic, I. Cipranic, Municipal Hydrotechnics, Faculty of Civil Engineering, Podgorica, 2015. 2. M. Milojevic, Water Supply and Sewerage of Settlements, Belgrade, 2002. 3. D. Ljubisavljević D, A. Đukić, B. Babić B. Wastewater treatment, Faculty of Civil Engineering, Belgrade, 2004. Additional literature: 4. D. Ljubisavljevic, A. Djukic, B. Babic, B. Jovanovic, Municipal Hydrotechnics, Examples from Theory and Practice, Faculty of Civil Engineering, Belgrade, 2001
Examination methods	