

<b>Study program:</b> Waste management			
<b>Course title:</b> Examination and characterization of waste			
<b>Professor/assistant:</b> PhD Biljana B. Milutinović			
<b>Type of course:</b> compulsory			
<b>ECTS credits:</b> 6			
<b>Pre-requisites:</b> -			
<b>Aims of the course:</b> Preparing students to: recognize the origin and type of waste, as well as types of non-hazardous and hazardous waste, recognize the morphological composition of waste, learn the physical and chemical characteristics of waste, learn methods for sampling and preparation of test samples, learn methods for testing waste characteristics, properly use instruments for testing and characterization of waste.			
<b>Learning outcomes:</b> Student is able to: apply standard sampling methods, prepare a sample of waste for testing, examine the physical and chemical characteristics of waste using standardized test methods, perform characterization of waste based on the obtained results, make a report about waste testing.			
<b>Syllabus</b>			
<i>Theoretical part</i> Types of hazardous and non-hazardous waste. Physical, chemical and biological characteristics of waste. Sampling of waste. Standardized methods for sampling waste. Packaging, storage, protection and transport of samples. Standardized methods for the preparation of samples for analysis. Examination of physical characteristics of waste. Examination of chemical characteristics of waste. Characterization of waste. Waste test report. Legal regulation in the area of testing and characterization of waste.			
<i>Practical part</i> Taking samples of waste on site. Preparation of samples for analysis. Testing and measuring of physical (humidity content, content of fuels volatile matter, content of pure carbon, ash content) and chemical characteristics (thermal power, content of certain groups of compounds, TOC etc.) of wastes and wastewater in the laboratory.			
<b>Literature</b>			
<ol style="list-style-type: none"> <li>1. D. Zekkos, <i>Geotechnical characterization, field measurement, and laboratory testing of municipal solid waste</i>, American Society of Civil Engineers, 2011.</li> <li>2. F. Woodard, <i>Industrial Waste Treatment Handbook</i>, Butterworth–Heinemann, 2001.</li> <li>3. StandardiSRPS CEN/TR 15310-(1-5):2009 Karakterizacija otpada-Uzimanje uzoraka otpada-Deo 1-5</li> </ol>			
<b>Number of active classes</b>			Other forms of teaching:
Lectures: 3	Practical classes: 3	Research work:	
<b>Teaching methods</b> Teaching is conducted interactively in the form of lectures, auditory, laboratory and computer exercises. In the lectures, theoretical part of the material is presented, accompanied by characteristic examples for easier understanding of the material. Computer exercises comprise the use of information and communication technologies in mastering the knowledge from the observed area. On laboratory exercises the equipment for waste testing is used. In addition to lectures and exercises, consultations are also held regularly.			
<b>Grading system</b> (maximum 100 points), <b>grading scale</b> from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.			
<b>Pre-exam obligations</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
activity during theoretical lectures	<b>10</b>	written exam	
practical training	<b>20</b>	oral exam	<b>30</b>
colloquium(s)/seminar papers	<b>40</b>		
<b>Sum</b>	<b>70</b>	<b>Sum</b>	<b>30</b>