

Study program: Waste management			
Course title: Software tools in environmental protection			
Professor/assistant: PhD Dušan M. Stefanović			
Type of course: elective			
ECTS credits: 6			
Pre-requisites: -			
Aims of the course: Preparing student to: introduce applications and tools used in the collection, analysis and processing of data, introduce tools for visualization, specification, construction and documentation of the business process, introduce terms such as Pivot tables and Power Pivot, understand the use of complex functions in data analysis, introduce the macros used for automatization of process, recognize tools for more efficient data processing.			
Learning outcomes: Student is able to: describe business processes using UML diagrams of activities and diagrams of cases, import the desired data from a variety systems for data storage and data retrieval, apply tools for processing imported data using quieter functions, write his own macros to automate the process, create charts, reports, Pivot and Power Pivot tables.			
Syllabus			
<u>Theoretical part</u> Software tools for modeling business processes using UML language to create activity diagrams, case diagrams, and time diagrams. View the sequential flow of activity through states, events, actions, and passages. Synchronization of events. Case diagram and activity diagram in case of waste management system. Software packages for processing and displaying data using advanced statistical, mathematical, date, text and <i>lookup</i> functions. Complex calculations of various types of costs in the waste management system. Graphic display of processed data, defining advanced filters, creating reports, and finding desired data using <i>lookup</i> functions. Connecting to the database and write them in the Power Pivot table. A more detailed layout and simpler data processing using the Pivot table. Automation of the process using recorded macros.			
<u>Practical part</u>			
Literature			
<ol style="list-style-type: none"> 1. M. Flower, <i>UML kratko: kratak vodič kroz standardni jezik za modelovanje objekata</i>, Mikroknjiga, 2004 2. K. Fraj, <i>Microsoft Excel 2010 : korak po korak</i>, CET, 2011 3. N. Vuković, S. Spasić, <i>Statistika za inženjere</i>, Singidunum, 2017 			
Number of active classes			Other forms of teaching:
Lectures: 2	Practical classes: 2	Research work:	
Teaching methods 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. In addition to lectures and exercises, consultations are also held regularly.			
Grading system (maximum 100 points), grading scale 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.			
Pre-exam obligations	points	Final exam	points
activity during theoretical lectures	10	written exam	
practical training	-	oral exam	30
colloquium(s)/seminar papers	40/20		
Sum	70	Sum	30