



POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR: 2020/2021

1. GENERAL COURSE INFORMATION

1.1 Course name	Sustainable waste management			
1.2 Study program/s	Undergraduate professional study Sustainable Development			
1.3 Course status (O,E)	O	1.6 Mode of instruction (number of hours)	Lectures	15
1.4 Course code	4064		Exercises	30
1.5 Course abbreviation	OGO		Seminars	-
1.6 Semester	4.		E-learning	Merlin
1.7 ECTS	4	1.7 Place and time of instruction	The premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website	

2. TEACHING STAFF

2.1 Course leader/s-title	Goran Sabol, pred.	contact	goran.sabol@mev.hr
		contact	
2.2 Assistant/s- title		contact	
		contact	
2.3 Instruction held by-title		contact	

3. COURSE DESCRIPTION

3.1 Course goals	Acquisition of knowledge about command-supervisory and economic instruments of environmental protection, system and tools for environmental management and standards used for the purpose of continuous improvement and implementation of the general environmental protection policy.									
3.2 Prerequisites	There are no prerequisites									
3.3 Course outcomes	After successfully completing the course, students will be able to:									
	I1	Analyze basic, but also adequately socially acceptable methods sustainable waste management - R4								
	I2	Categorize all waste management activities and apply them in practice - R4								
	I3	Analyze the regulations of sustainable waste management and apply them in practice - R4								
	I4	Predict risks and determine the degree of risk in hazardous waste management - R5								
	I5	Predict the generation of waste types in a particular activity and conclude how which type of waste is treated - R6								
	I6	Recommend measures for achieving the goals and guidelines of the waste management concept - R6								
3.4 Course content	Introduction to the basic concept of sustainable waste management, classification and technologies for waste disposal.									
3.5 Types of coursework	X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
		Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship

	Other																																																																											
3.6 Language of instruction	Croatian/English																																																																											
3.7 Monitoring students' work (enter the number of ECTS credits for each activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)	1,5	Class attendance	1	Seminars		Essay																																																																						
		Class activity		Project		Report/paper																																																																						
		Midterm exams		Practical task		Continuous knowledge check																																																																						
	1,0	Written exam		Experimental work																																																																								
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3.8 Assessment and evaluation of students' work during classes and at the final exam	<table border="1"> <thead> <tr> <th>Activity specification</th> <th>Percent %</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Assessment during instruction</td> </tr> <tr> <td>Attendance</td> <td>2,5%</td> <td>2,5</td> </tr> <tr> <td>Class activity</td> <td>2,5%</td> <td>2,5</td> </tr> <tr> <td>Seminar/ project/ essay</td> <td>10%</td> <td>10</td> </tr> <tr> <td>Midterm exam 1</td> <td>42%</td> <td>42</td> </tr> <tr> <td>Midterm exam 2</td> <td>43%</td> <td>43</td> </tr> <tr> <td colspan="3" style="text-align: center;"><i>Exam assessment for the students who failed to fulfill all the obligatory requirements during the semester</i></td> </tr> <tr> <td>Written exam</td> <td>50%</td> <td>50</td> </tr> <tr> <td>Oral exam</td> <td>50%</td> <td>50</td> </tr> <tr> <td>Total:</td> <td>100%</td> <td>100</td> </tr> </tbody> </table>						Activity specification	Percent %	Points	Assessment during instruction			Attendance	2,5%	2,5	Class activity	2,5%	2,5	Seminar/ project/ essay	10%	10	Midterm exam 1	42%	42	Midterm exam 2	43%	43	<i>Exam assessment for the students who failed to fulfill all the obligatory requirements during the semester</i>			Written exam	50%	50	Oral exam	50%	50	Total:	100%	100																																					
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3.10 Specific features related with taking the course	<p>If the student collects 50% of the points of each outcome directly access orally exam. If a student does not achieve a sufficient number of points on the midterm exam, he cannot take the next midterm exam.</p> <p>Once won points in intermediate exams for each learning outcome are no longer deleted unless the student decides to correct the result for each learning outcome, whereby the points won until then are deleted and newly achieved points for that learning outcome are entered. A student cannot access the exam period if he / she has not submitted and presented seminar paper. The final grade is obtained on the oral part of the exam.</p>																																																																											

	<p>Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. Part-time students are required to attend at least 30% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. If the student has not fulfilled all the obligations set by the course, he is obliged to attend the lectures again and meet the conditions for taking the exam. Attendance can be offset by online tuition, organised webinars and added assignments given by teachers. One lesson lasts 45 minutes, and several hours form a teaching unit. Absence from one teaching unit is counted as one absence. Delays and apologies are recorded separately. In that case, if the student missed more than 50% of classes, and has a justifiable reason/apology, the request should be submitted to the Department Council, which then decides on the justification of student absences with the obligatory opinion of the course leader.</p>						
3.11 Students obligations	<p>Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. Part-time students are required to attend at least 30% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. If the student has not fulfilled all the obligations set by the course, he is obliged to attend the lectures again and meet the conditions for taking the exam. Attendance can be offset by online consultations, organized webinars, and added assignments given by teachers. One lesson lasts 45 minutes, and several hours form a teaching unit. Absence from one teaching unit is counted as one absence. Delays and apologies are recorded separately. In the event that a student is absent from more than 50% of classes, and has a justifiable reason / apology, a request should be submitted to the Department Council, which then decides on the justification of student absences with the obligatory opinion of the course leader.</p>						
3.12 Written assignments	<p>Seminar papers must be computer written and may have a maximum of 12 text cards (Times New Roman, font 12) from introduction to conclusion, together with pictures, table appendices, etc. Seminar papers must have an adequate title page, content, marked pages and literature. The seminar paper should be divided into chapters and contain a list of references and a list of figures and tables and graphs and finally a summary / conclusion in the size of 250 words. The student guarantees the authenticity of the work with his signature.</p>						
3.13 Required reading	<table border="1"> <tr> <td>1.</td> <td>Pravilnik o održivom gospodarenju otpadom (94/13, 73/17)</td> </tr> <tr> <td>2.</td> <td>D. Kiš, S. Kalambura: Gospodarenje otpadom I, Poljoprivredni fakultet u Osijeku, 2018.</td> </tr> <tr> <td>3.</td> <td>S. Kalambura, D. Kiš, S. Guberac: Gospodarenje otpadom II, Poljoprivredni fakultet u Osijeku, 2018l</td> </tr> </table>	1.	Pravilnik o održivom gospodarenju otpadom (94/13, 73/17)	2.	D. Kiš, S. Kalambura: Gospodarenje otpadom I, Poljoprivredni fakultet u Osijeku, 2018.	3.	S. Kalambura, D. Kiš, S. Guberac: Gospodarenje otpadom II, Poljoprivredni fakultet u Osijeku, 2018l
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4 ADDITIONAL COURSE INFORMATION							
4.1 Quality control	<p>The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardised ways and in accordance with the by-laws of the Polytechnic of Međimurje in Čakovec.</p>						
4.2 Contact the teacher	<p>Students can contact the teacher during the office hours and during classes, while for short questions and explanations they can contact him/her any day during working hours by coming in person or by landline. It is also possible to</p>						

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	ask questions by e-mail, which will be answered in 48 hours at the latest. It is desirable for students to come as often as possible for any possible questions during the teacher's office hours.
4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the classes or possible postponement of classes will be posted on the bulletin board and on the website of the Polytechnic at least 24 hours in advance.
4.4 Course contribution to the study program	<p>I1 - Interpret information, ideas, problems and solutions to professional and general audiences</p> <p>I3 - Use foreign languages in professional communication and use of professional literature</p> <p>I4 - Advocate an ethical approach to work and to associates in project teams</p> <p>I8 - Interdisciplinary to solve engineering problems of sustainable development</p> <p>I9 - Plan a circular economy in accordance with the legal framework in the Republic of Croatia</p> <p>I10 - Interpret European Union legislation in the field of sustainable development</p> <p>I22 - Plan facility management and maintain building and civil engineering facilities</p> <p>I27 - Assess potential risks to the environment and cooperate in the preparation of environmental studies and studies on the impact of the project on the environment</p>

5. ANALYSIS OF COURSE TOPICS (the number of hours is equal to the number of lectures and exercises of the course)

LECTURES				
Hours	Topic and description	Method	Learning outcomes	Course outcome
1.	Waste management concept - basics and legislation	Presentation, PP presentation	Understand waste management	I1, I2
2.	Principles, objectives, methods of waste management, waste management hierarchy and economic analysis	Presentation, PP presentation	Understand and be able to explain the concept of waste management	I1, I3
3.	Planning and establishing a sustainable waste management system	Presentation, PP presentation	Understand the waste management system	I1, I3
4.	Waste classification and management of special waste categories	Presentation, PP presentation	Define and classify waste	I2
5.	Waste management plans	Presentation, PP presentation	Understand the content of the waste management plan	I1, I2
6.	Programs and ways to reduce waste	Presentation, PP presentation	Use waste management programs	I1, I2
7.	Waste Management Center - basics and characteristics	Presentation, PP presentation	Understand the concept and significance of a waste management center	I4, I5

8.	Waste collection, transport and storage	Presentation, PP presentation	Understand principles and methods	15
9.	Waste treatment, recovery and disposal technologies	Presentation, PP presentation	Understand the technology and ways of disposing of waste	15
10.	Ways of waste characterization - methodologies	Presentation, PP presentation	Analyze the methodology of waste characterization according to the waste catalog	15, 16
11.	Hazardous waste - characteristics, types, sources, management methods	Presentation, PP presentation	Identify hazardous waste	14
12.	Reducing the amount at the source and reducing the hazardous properties of the waste	Presentation, PP presentation	Understand measures to reduce waste at source	16
13.	Physico-chemical treatment of hazardous waste, remediation, solidification, thermal treatment of waste	Presentation, PP presentation	Understand municipal solid waste treatment technology	14
14.	Waste records and reporting	Presentation, PP presentation	Show the completion of ONTO forms	12
15.	Administrative and inspection supervision of waste management	Presentation, PP presentation	Understand the importance of inspection	13
EXERCISES/ SEMINARS				
Hours	Topic and description	Method	Learning outcomes	Course outcome
1. 2.	Defining the concept of waste management	Independent task	Explain the concept of waste management	11
3. 4.	Waste management hierarchy analysis and economic evaluation of waste management	Independent task	Interpret and understand waste management analysis	11, 12
5. 6.	Analysis of sustainable waste management system	Independent task	Define and explain the waste management system	11
7. 8.	Waste classification	Independent task	Define and classify waste	12, 15
9. 10.	Review of existing LGU waste management plans	Independent task	Analyze JLS plans	13
11. 12.	An overview of examples from the practice of waste reduction programs	Independent task	Interpret the example	16
13. 14.	Overview of examples of realized waste management centers	Independent task	Interpret the example	15, 16

15. 16.	Analysis of examples from the practice of realized ways of waste management in the world	Independent task	Interpret the example	15, 16
17. 18.	Analysis of examples of waste treatment technologies	Independent task	Interpret the example	15, 16
19. 20.	Waste characterization	Independent task	Classify waste	12
21. 22.	Choose the right way of waste management and define the characteristics of waste	Independent task	Apply knowledge	15, 16
23. 24.	Examples of good waste reduction practices at source	Independent task	Interpret the example	15, 16
25. 26.	Examples of physico-chemical treatment of waste	Independent task	Interpret the example	15, 16
27. 28.	Making reports on waste management	Independent task	Interpret the report	13
29. 30.	Administrative and inspection supervision of waste management	Independent task	Understand the importance of supervision	13