



# POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

## COURSE SYLLABUS

ACADEMIC YEAR: 2020/2021

### 1. GENERAL COURSE INFORMATION

<b>1.1 Course name</b>	<b>Environmental sustainability</b>			
<b>1.2 Study program/s</b>	Undergraduate professional study Sustainable Development			
<b>1.3 Course status (O,E)</b>	E	<b>1.6 Mode of instruction (number of hours)</b>	<b>Lectures</b>	15
<b>1.4 Course code</b>	4081		<b>Exercises</b>	30
<b>1.5 Course abbreviation</b>	ES		<b>Seminars</b>	
<b>1.6 Semester</b>	V		<b>E-learning</b>	
<b>1.7 ECTS</b>	4	<b>1.7 Place and time of instruction</b>	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website	

### 2. TEACHING STAFF

<b>2.1 Course leader/s-title</b>	Silvija Zeman, Ph.D, senior lecturer	<b>contact</b>	szeman@mev.hr
		<b>contact</b>	
<b>2.2 Assistant/s- title</b>		<b>contact</b>	
		<b>contact</b>	
<b>2.3 Instruction held by- title</b>		<b>contact</b>	

### 3. COURSE DESCRIPTION

<b>3.1 Course goals</b>	The student gets acquainted with all processes that endanger natural resources, ways and methods of integrated and environmentally sustainable approach to development, management, use and protection of natural resources and the environment, counting all the above through the ecological footprint that defines the ecological sustainability of a particular area or way of life. Recognizing the damage in planning, architecture and construction that business systems can cause to natural ecosystems, thus limiting the development of business systems by applying a policy of sustainable ecological development. Applications of course content in business practice.
<b>3.2 Prerequisites</b>	There are no conditions
<b>3.3 Course outcomes</b>	After successfully completing the course, students will be able to: <ul style="list-style-type: none"> <li>11 Distinguish and analyse the basic concepts of environmental sustainability, legislation and apply them in everyday situations</li> <li>12 Understand and use basic concepts related to the basic components of the environment: environmental protection, nature protection, sustainable soil management, soil protection, water protection, forest protection, spatial planning.</li> <li>13 Design a presentation on a specific topic and present it to the group.</li> <li>14 Compare and select sustainable construction systems, but also the protection of space and environment in construction (compare the impact of spatial plans-use of space and environmental protection, environmental tolerance testing, the impact of construction on the environment).</li> </ul>

	15 Compare the connection and impact of man and his environment, give an example of mutual interactions, and measures to prevent and reduce negative human impact on the environment.																																					
<b>3.4 Course content</b>																																						
<b>3.5 Types of coursework</b>	x	Lectures	x	Exercises		Blended e-learning	Individual activities	Laboratory																														
	x	Seminars and workshops		Distant learning		Field classes	Multimedia and network	Mentorship																														
		Other																																				
<b>3.6 Language of instruction</b>	Croatian / English																																					
<b>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)</b>	1,5	Class attendance	0,5	Seminars		Essay																																
	0,5	Class activity		Project		Report/paper																																
	1,00	Midterm exams		Practical task		Continuous knowledge check																																
		Written exam		Experimental work																																		
	1,00	Oral exam		Research																																		
<b>3.8 Assessment and evaluation of students' work during classes and at the final exam</b>	<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>5%</td> <td>5</td> </tr> <tr> <td>Class activity</td> <td>5%</td> <td>5</td> </tr> <tr> <td>Seminar/ project/ essay</td> <td>30%</td> <td>30</td> </tr> <tr> <td>Midterm exam 1</td> <td>30%</td> <td>30</td> </tr> <tr> <td>Midterm exam 2</td> <td>30%</td> <td>30</td> </tr> <tr> <td colspan="3" style="text-align: center;"><i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i></td> </tr> <tr> <td>Written exam</td> <td>60%</td> <td>60</td> </tr> <tr> <td><b>Total:</b></td> <td><b>100%</b></td> <td><b>100</b></td> </tr> </tbody> </table>								Activity specification	Percent %	Points	Assessment during instruction			Attendance	5%	5	Class activity	5%	5	Seminar/ project/ essay	30%	30	Midterm exam 1	30%	30	Midterm exam 2	30%	30	<i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i>			Written exam	60%	60	<b>Total:</b>	<b>100%</b>	<b>100</b>
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<b>3.9 Assessment criteria – analysis per learning outcomes</b>	<b>Ways of evaluating learning outcomes</b>																																					
		<b>Attendance</b>	<b>Activity</b>	<b>Mid-term exam 1</b>	<b>Mid-term exam 2</b>	<b>Practical work</b>	<b>Total</b>																															
	Outcome 1			5		5	10																															
	Outcome 2			10	5	5	20																															
	Outcome 3			10	5	5	20																															
	Outcome 4			5	10	5	20																															
	Outcome 5				15	5	20																															
	Outcome not-related	5	5				10																															
	<b>Total</b>	<b>5</b>	<b>5</b>	<b>30</b>	<b>35</b>	<b>25</b>	<b>100</b>																															
	<p>Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)</p> <p>Points      Grade</p> <p>89 – 100    excellent (5)</p> <p>76 – 88     very good (4)</p> <p>63 – 75     good (3)</p> <p>50 – 62     pass (2)</p> <p>0 – 49      fail (1)</p>																																					

<b>3.10 Specific features related with taking the course</b>	<p>If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (exercises). A student cannot access the exam period if he / she has not achieved a min for each exercise. 60% correct answers. Practical work-exercises are made according to the instructions published on the Merlin system and are submitted by placing on the Merlin. Checking the completed exercises is done in the exercise classes after prior preparation with the teacher. Throughout the semester, the student is required to perform six exercises independently. Practical work (completed exercises) is taught until the last week of lectures. During the exam, it is possible to orally check the knowledge from practical work (exercises).</p> <p>If a student does not achieve a sufficient number of points on the midterm exam, he / she cannot take the next midterm exam.</p> <p>Once achieved 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.</p> <p>The final grade is obtained on the exam period and is the sum of points earned during classes.</p> <p>Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed exercises before taking the exam.</p>	
<b>3.11 Students obligations</b>	<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.</p> <p>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>	
<b>3.12 Written assignments</b>	<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, appendices to tables, 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 of 250 words. The student guarantees the authenticity of the work with his signature.</p>	
<b>3.13 Required reading</b>	1.	Melita Srpak: Ecological Sustainability, 2017., Međimurje Polytechnic in Čakovec, script
<b>3.14 Additional reading</b>	1.	Glavač, V., Introduction to Global Ecology, Hrvatska svečilišna naklada, Zagreb, 2010.
<b>4 ADDITIONAL COURSE INFORMATION</b>		
<b>4.1 Quality control</b>	<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>	

<b>4.2 Contact the teacher</b>	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 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.
<b>4.3 Information about the course</b>	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.
<b>4.4 Course contribution to the study program</b>	<p>Interpret information, ideas, problems and solutions to professional and general audiences</p> <p>Use new technologies and techniques as part of the lifelong learning process</p> <p>Advocate an ethical approach to work and to associates in project teams</p> <p>Critically evaluate arguments, assumptions and data in order to form opinions and contribute to solving the problem</p> <p>Manage water, air, soil, waste and energy in a sustainable way</p> <p>Formulate simple problems in the field of environmental protection in order to solve them by applying the principles of sustainable development</p>

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

<b>LECTURES</b>				
<b>Hours</b>	<b>Topic and description</b>	<b>Method</b>	<b>Learning outcomes</b>	<b>Course outcome</b>
		<ul style="list-style-type: none"> <li>• Direct teaching (lecture, instruction, pp presentation)</li> <li>• Discovery learning (individual, lead, discussion)</li> <li>• Group learning</li> <li>• Case study</li> <li>• Field classes...</li> </ul>		
<b>1.</b>	Introduction to the course, teaching syllabus Historical development of ecology and ecological sustainability	Presentation, pp presentation	Interpret the concepts of ecology, ecological sustainability, biocenosis, biotope, environment, ecosystem, basic laws in the ecosystem.	I1
<b>2.</b>	Global environmental problems	Presentation, pp presentation	Connect the world's population, human activities, changes in the use of natural resources, changes in flora and fauna, the impact of agriculture, industry and	I1 I2

			transport on the environment, energy sources, waste and its disposal.	
<b>3.</b>	Human influence on the pedosphere, lithosphere, hydrosphere and cryosphere	Presentation, pp presentation	Describe changes in land use, the problem of arable land, erosion, compaction, use of minerals, urban and infrastructure coverage. Changes in the hydrosphere and cryosphere.	12 13
<b>4.</b>	Legislation on spatial management in protected areas	Presentation, pp presentation	Define the Law on Nature Protection, the Law on Environmental Protection, the Strategy and Action Plan for the Protection of Biological and Landscape Diversity, the Convention for the Protection of the World Cultural and Natural Heritage, etc.	11 12 13
<b>5.</b>	Environmental sustainability indicators	Presentation, pp presentation	To connect the mutual influence of agriculture, as an economic branch, the environment in which agricultural activities take place, and their influence on protected areas.	12 13
<b>6.</b>	Sustainable soil management	Presentation, pp presentation	Define soil as a source of greenhouse gases, interpret soil roles, describe soil management in ecologically sensitive areas	11 12 13
<b>7.</b>	Sustainable waste management	Presentation, pp presentation	Interpret a comprehensive waste management system	12 13 15

8.	Colloquium 1			I1 I2 I3
9.	Landscape protection	Presentation, pp presentation	Define the landscape as part of the environment	I2 I3 I5
10.	Meteorological aspects of atmospheric pollution	Presentation, pp presentation	Name the types and sources of pollutants in the atmosphere.	I2 I3
11.	Meteorological aspects of atmospheric pollution	Presentation, pp presentation	Processes acting on atmospheric pollutants.	I2 I3 I5
12.	Groundwater protection	Presentation, pp presentation	Describe water quality management	I3 I5
13.	Forest ecology	Presentation, pp presentation	Describe a sustainable way of forest management	I3 I5
14.	Environmental protection in construction - sustainable construction	Presentation, pp presentation	To connect the impact of cities (settlements) on the environment and the impact and protective measures of construction and maintenance of roads on the environment.	I4 I5
15.	Colloquium 2			I4 I5

**EXERCISES/ SEMINARS**

<b>Hours</b>	<b>Topic and description</b>	<b>Method</b>	<b>Learning outcomes</b>	<b>Course outcome</b>
		<ul style="list-style-type: none"> <li>• Direct teaching (lecture, instruction, pp presentation)</li> <li>• Discovery learning (individual, lead, discussion)</li> <li>• Group learning</li> <li>• Case study</li> <li>• Field classes...</li> </ul>		
1.	Historical development of ecology and ecological sustainability	Group learning	Connect and interpret the concepts of ecology, ecological sustainability, biocenosis, biotope, environment, ecosystem, basic	I1

			laws in the ecosystem.	
2.	Global environmental problems	Discovery learning, guided (scientific papers and scientific shows)	Discuss changes in the use of natural resources and other environmental issues	I1 I2
3.	Human influence on the pedosphere, lithosphere, hydrosphere and cryosphere	Learning by discovery, discussion	Define the problem of arable land, erosion, compaction, use of mineral resources, covering cities and infrastructure facilities. Changes in the hydrosphere and cryosphere.	I2 I3
4.	Legislation on spatial management in protected areas	Case study, discussion	Interpret the Strategy and Action Plan for the Protection of Biological and Landscape Diversity, the Convention Concerning the Protection of the World Cultural and Natural Heritage, etc.	I1 I2 I3
5.	Environmental sustainability indicators	Case study, discussion	Analyse the impact of agriculture on the environment	I2 I3
6.	Sustainable soil management	Guided learning, discussion	Interpret economically and environmentally efficient solutions according to the concept of sustainable agriculture. Soil management in environmentally sensitive areas	I1 I2 I3
7.	Sustainable waste management	Case study, discussion	Summarize the remediation of existing landfills, Waste Management Plan of the Republic of Croatia, Complete	I2 I3 I5

			waste management system	
8.	Landscape protection	Case study	Define norms and standards in landscape: parks and nature reserves, exceptional landscapes. Nature protection systems (Natura 2000 and acceptability assessment).	12 13 15
9.	Meteorological aspects of atmospheric pollution	Guided learning, discussion	Interpret the long-distance transmission of pollutants ("acid rain"). Tropospheric and stratospheric ozone ("photochemical smog, ozone holes"). Possibility of anthropogenic warming of the atmosphere ("greenhouse effect").	12 13 15
10.	Groundwater protection	Guided learning, discussion Case study	Explain the protection of drinking water sources and research in case of groundwater pollution	13 15
11.	Forest ecology	Seminars, discussion	Interpret permanent forest management	13 15
12.	Environmental protection in construction - sustainable construction	Guest lecturer, discussion	Define disturbances as a consequence of the use of buildings: residential settlements, roads. Energy renovation program of buildings projects.	14 15
13.	Spatial planning and urbanism	Guest lecturer, discussion Melita Srpak	Identify the Physical Planning Program of the Croatian Regional Plan County Spatial Plan of the city,	13 14 15



			municipal spatial plans, plans DPU / UPU, as prerequisites of green building, selection and management of sustainable locations	
<b>14.</b>	Measures to prevent adverse effects on the environment	Examples, discussion Guest lecturer	Select Interventions and actions in space and environment related to settlements, agriculture, forestry, soil, air, natural heritage, noise protection measures	13 14 15
<b>15.</b>	Seminars	discussion	Discuss environmental issues	12,3,4,5