POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR:	2020/2021

1. GENERAL COURSE INFORMATION

1.1 Course name	**Fundamentals of Biology**			
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**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation			**Seminars**	
1.6 Semester	V.		**E-learning**	
1.7 ECTS	5	**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	dr. sc**. Darinka Kiš-Novak, Ph. D, biologist** dipl. ing. biol. s ekol., prof. biol., prof. v. š.	**contact**	**dkisnovak@mev.hr**
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title		**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	Adopt the basics of biological principles, the basics of evolution, the basics of taxonomy and classification and knowledge of the functioning of all levels of ecosystems and bioms
3.2 Prerequisites	none
3.3 Course outcomes	It is expected that students after completing the course: • Identify basic biological phenomena in nature • Explain the basic biological principles and mechanisms at all levels of living being organization, explain, connect, and describe specifics • Explain the basic structure, properties and processes in which nucleic acids participate as a basis for molecular mechanisms by which DNA controls development, growth, or morphological characteristics organism (phenotype, genotype, genome, protein) • Analyze the anatomical and physiological principles and processes in the human body as an animal model organism • Analyze the main structural elements and processes involved in reproduction, growth, maintenance and regulating the work of the cell and thus enable the survival of living beings.

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• Explain the principles and laws of inheritance at the level of the cell, individual and population.
• Analyze the connection between the organization of bacteria, viruses and prokaryotes and the cells of eukaryotic organisms with their function
• Use basic microscopy accessories
• Distinguish, recognize and show the organization of the type of cells, organs, organic systems of fauna and flora
• Understand and use basic concepts related to biological literacy in professional texts
• Set a hypothesis
• Describe diversity, analyze facts, and compare the diversity of empires, taxonomies, and taxonomies
• Design a presentation on a specific topic and present it to the group.
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<tr><td>3.4 Course content</td><td>Development of biology as a science of living beings; branches of biology; technology and
biosciences</td></tr>
<tr><td>3.5 Types of coursework</td><td>
<table>
<tr><td>x</td><td>Lectures</td><td>x</td><td>Exercises</td><td></td><td>Blended e-learning</td><td>x</td><td>Individual activities</td><td></td><td>Laboratory</td></tr>
<tr><td></td><td>Seminars and workshops</td><td>x</td><td>Distant learning</td><td></td><td>Field classes</td><td></td><td>Multimedia and network</td><td></td><td>Mentorship</td></tr>
<tr><td></td><td>Other</td><td colspan="8"></td></tr>
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<tr><td>3.6 Language of instruction</td><td>Croatian and English</td></tr>
<tr><td>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)</td><td>
<table>
<tr><td>2</td><td>Class attendance</td><td></td><td>Seminars</td><td>0,5</td><td>Essay</td></tr>
<tr><td>0,5</td><td>Class activity</td><td></td><td>Project</td><td></td><td>Report/paper</td></tr>
<tr><td>0,5</td><td>Midterm exams</td><td></td><td>Practical task</td><td></td><td>Continuous knowledge check</td></tr>
<tr><td></td><td>Written exam</td><td></td><td>Experimental work</td><td></td><td></td></tr>
<tr><td>1</td><td>Oral exam</td><td>0,5</td><td>Research</td><td></td><td></td></tr>
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<tr><td>3.8 Assessment and evaluation of students' work during classes and at the final exam</td><td>
<table>
<tr><th>Activity specification</th><th>Percent %</th><th>Points</th></tr>
<tr><td colspan="3">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">Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester</td></tr>
<tr><td>Written exam</td><td>60%</td><td>60</td></tr>
<tr><td>Total:</td><td>100%</td><td>100</td></tr>
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<tr><td>3.9 Assessment criteria – analysis per learning outcomes</td><td>During the semester, students will write 2 midterm exams, and give a presentation on a specific topic.
The 1st midterm exam is written after the first 7 weeks of classes and covers the learning outcomes covered in the first 7 weeks. The 2nd midterm exam is written after the other 7 weeks of classes and covers the learning outcomes covered in the other 7 weeks of classes.</td></tr>
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	Intermediate exams are taken during the duration of classes in the 1st week after each cycle of 7 weeks of classes. The type of questions is defined by the teacher, but all questions and tasks cover the course material or learning outcomes.

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			5		5	10
Outcome 2			10	10	5	25
Outcome 3			5	5	5	15
Outcome 4			5	10	5	20
Outcome 5				10		10
Outcome not-related	5	5		10		20
Total	**5**	**5**	**25**	**45**	**20**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course	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 posting on the Merlin. Checking the completed exercises is done in practice classes after prior preparation with the teacher. During 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). If a student does not achieve a sufficient number of points on the midterm exam, he / she cannot take the next midterm exam. Once achieved points in intermediate exams for each learning outcome are no longer deleted unless the student decides to correct the result for a particular learning outcome, whereby the points won until then are deleted and newly achieved points for that learning outcome are entered. The final grade is obtained on the exam period and is the sum of points earned during classes. 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.

3.11 Students obligations	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.	
3.12 Written assignments	The discussion essay must be written in computer and may have a maximum of 800 words (Times New Roman, font 12) from introduction to conclusion, together with pictures, table appendices, etc. An essay or rehearsal is a type of exam and should be practiced. What is judged in the essay? Your understanding of the text and how successfully you have made the structure of the essay (introductory part). If you have described the problematization according to the guidelines. If you used the Croatian language, spelling, grammar correctly. Your written expression and writing style. If you have supported your claims (views, opinions) with quotes or paraphrases. The essay is of limited length: 600 to 800 words. The essay is written on the basis of the offered text (texts). TEXT OFFERED: YOUR SEMINAR TOPIC! Discussion essay: Read carefully. Argue your position with quotes, facts. Be critical, objective, but also subjective when needed. Useful expressions with a discussion essay: argument, proof, personal attitude, questioning, background, opposition, connotation, discussion, conclusion… Essay writing (tips): Composition - essay structure: introductory part, elaboration parts, concluding part. Define keywords or terms in the text Use quotes If the title is not given, think of it yourself and let the thought be extracted from the text of your essay. To write exactly what you are asked to do, follow the writing guidelines First, answer the questions you know the answer to Answer only what you are asked, not some other questions It is important (if necessary) to read the text several times with understanding The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	Cooper, Geoffrey M. Sunderland (MA) 2000 The Cell - A Molecular Approach, 2nd ed. Sinauer Associates, Inc;
	2.	Denffer, D., Ziegler, H. 1991: Udžbenik botanike za visoke škole. Morfologija i fiziologija.- Školska knjiga, Zagreb.
	3.	Habdija, I., Primc Habdija, B., Radanović, I., Vidaković, J., Kučinić, M., Špoljar, M., Matoničkin, R., Miliša, M., 2004: Protista-Protozoa i

		Metazoa-Invertebrata. Funkcionalna građa i praktikum.- Meridijani, Samobor.
	4.	Matoničkin, I. ; Klobučar, G.; Kučinić, M. 2010: Opća zoologija. Školska knjiga, Zagreb.
3.14 Additional reading	1.	Selected texts from professional journals
	2.	Selected texts from university and high school textbooks
	3.	Lecture notes

4 ADDITIONAL COURSE INFORMATION	
4.1 Quality control	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.
4.2 Contact the teacher	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.
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	Interpret information, ideas, problems and solutions to professional and general audiences. Use new technologies and techniques as part of the lifelong learning process. Use foreign languages in professional communication and use of professional literature. Advocate an ethical approach to work and to associates in project teams. Critically evaluate arguments, assumptions and data in order to form opinions and contribute to the solution of the problem. Solve engineering problems of sustainable development using mathematics, physics, chemistry and biology. Interdisciplinary to solve engineering problems of sustainable development.

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** • Direct teaching (lecture, instruction, pp presentation) • Discovery learning (individual, lead, discussion) • Group learning • Case study • Field classes…	**Learning outcomes**	**Course outcome**

1.	Prokaryotic and eukaryotic cell type	Presentation, pp presentation, video Presentation, pp presentation video	Interpret	I1-4
2.	Biomembranes and the passage of matter through the membrane	Presentation, pp presentation video	Apply analyzes	I1-4
3.	Structure and function of the cell nucleus. Structure and function of chloroplasts and mitochondria	Presentation, pp presentation video	Apply analyzes	I1-4
4.	Cytoskeleton, structure of the whip, basal body and centrosome Mitosis (chromosomes)	Presentation, pp presentation video	Apply the principles	I1-4 I2-4
5.	Meiosis	Presentation, pp presentation video	Apply	I3
6.	Animal embryogenesis: furrow types, germ leaf formation, histological differentiation, body cavities	Presentation, pp presentation Video	Interpret	I4
7.	Colloquium (Intermediate Exam 1) Postembryonic animal development	Presentation, pp presentation video	Interpret	I1-6
8.	Principles of distribution and review of animal diversity	Presentation, pp presentation Video	Interpret	I1-4 I1-4
9.	Animal tissues: epithelial, connective, muscular and nervous	Presentation, pp presentation Video	Show examples	I1-4
10.	Structure and role of organs and organ systems: skin and support system. The structure and role of the muscular, nervous and sensory systems.	Presentation, pp presentation Video	Apply	I1-4
11.	Plant development. Basic principles of classification and systematics of the living world. An overview of the biological diversity of Monera, Protista and the plant	Presentation, pp presentation Video	Apply knowledge and interpret	I1-4

	kingdom			
12.	Plant development. Basic principles of classification and systematics of the living world. An overview of the biological diversity of Monera, Protista and the plant kingdom	Presentation, pp presentation Video	The example Interpret	I1-4
13.	Morphology of plant vegetative organs. Flower structure 1	Presentation, pp presentation Video		I1-6
14.	Flower structure 2	Presentation, pp presentation Video		I1-6
15.	Colloquium (Intermediate Exam 2)			I1-6
EXERCISES/ SEMINARS				
Hours	**Topic and description**	**Method** • Direct teaching (lecture, instruction, pp presentation) • Discovery learning (individual, lead, discussion) • Group learning • Case study • Field classes…	**Learning outcomes**	**Course outcome**
1.	Prokaryotic and eukaryotic cell type	• microscopy	*Interpret*	I1-4
2.	Biomembranes and the passage of matter through the membrane	• laboratory exercises, experiments	Apply analyzes	I1-4
3.	Structure and function of the cell nucleus. Structure and function of chloroplasts and mitochondria	• exercises	Apply analyzes	I1-4
4.	Cytoskeleton, structure of the whip, basal body and centrosome Mitosis (chromosomes)	• discovery learning, independent, scientific literature	Apply the principles	I1-4 I2-4
5.	Meiosis	• learning by discovery	Apply	I3
6.	Animal embryogenesis: furrow types, germ leaf formation, histological differentiation, body cavities	• drawings, learning by discovery	Interpret	I4
7.	Colloquium (Intermediate Exam 1)	• apply knowledge	Interpret	I1-6

	Postembryonic animal development	• drawings, learning by discovery		
8.	Principles of distribution and review of animal diversity	• scientific literature	Interpret	I1-4 I1-4
9.	Animal tissues: epithelial, connective, muscular and nervous	• microscopy	Show examples	I1-4
10.	Structure and role of organs and organ systems: skin and support system. The structure and role of the muscular, nervous and sensory systems.	• microscopy	Apply	I1-4
11.	Plant development. Basic principles of classification and systematics of the living world. An overview of the biological diversity of Monera, Protista and the plant kingdom	Individual, group	Apply knowledge and interpret	I1-4
12.	Plant development. Basic principles of classification and systematics of the living world. An overview of the biological diversity of Monera, Protista and the plant kingdom	Individual, group	The example Interpret	I1-4
13.	Morphology of plant vegetative organs. Flower structure 1	Individual, group	The example	I1-6
14.	Flower structure 2	Individual, group	Apply knowledge	I1-6
15.	Colloquium (Intermediate Exam 2)	individual	Apply knowledge	I1-6