SYLLABUS – A COURSE DESCRIPTION

I. General informaion

1. Course name: **Basic molecular methods_2020en**
2. Course code: **01-EPA-MOLMETHO**
3. Course type (compulsory or optional): **optional**
4. Study programme name: **Environmental protection**
5. Cycle of studies (1st or 2nd cycle of studies or full master's programme): **2nd cycle of studies**
6. Educational profile (general academic profile or practical profile): **general academic profile**
7. Year of studies (if relevant): **I**
8. Type of classes and number of contact hours (e.g. lectures: 15 hours; practical classes: 30 hours):
   lectures: 10 hours
   practical classes: 20 hours
9. Number of ECTS credits: **3**
10. Name, surname, academic degree/title of the course lecturer/other teaching staff:
    dr hab. Małgorzata Wojtkowska, woytek@amu.edu.pl
    prof. dr hab. Hanna Kmita, kmita@amu.edu.pl
    mgr Amit Kumar Nagwani, aminag@amu.edu.pl
11. Language of classes: **english**
12. Online learning – yes (partly – online / fully – online) / no: **The course might be performed partially by e learnig: lectures and part of the laboratory lessons (using Microsoft Teams and Moodle platform).**

II. Detailed information

1. Course aim (aims)
   1. to deepen student knowledge on nucleic acids and proteins, and functional relationships between these molecules as well as provide knowledge on molecular biology basic methods enabling research of nucleic acids and proteins in the context of environmental studies;

   2. to make student capable for individual selection of basic methods of molecular biology and their application, and interpretation of obtained results;

   3.to develop student teamwork skills.
2. Pre-requisites in terms of knowledge, skills and social competences (if relevant)
   1. Basic knowledge on proteins and nucleic acids. 2. Critical thinking and teamwork skills.
3. Course learning outcomes (EU) in terms of knowledge, skills and social competences and their reference to study programme learning outcomes (EK)

Course learning outcome symbol (EU)	On successful completion of this course, a student will be able to:	Reference to study programme learning outcomes (EK)
EU_01	depict essential data on structure and function of nucleic acids and proteins as well as their contribution to cell functioning	K_W01, K_U01, K_U07, K_K02

EU_02	explain the meaning of research on nucleic acids and proteins in environmental studies	K_W06, K_U01, K_U06, K_U11, K_K02
EU_03	characterise molecular biology basic methods dedicated to research on nucleic acids and proteins	K_W01, K_U03, K_K05, K_U10
EU_04	design an experiment based on analysis of nucleic acids and/or proteins, suitable in environmental studies	K_W01, K_U01, K_U03, K_K05
EU_05	cooperate in group to perform experiment based on molecular biology basic methods, make analysis of obtained data and draw conclusions perform data analysis and write the conclusions.	K_W01, K_U03, K_U08, K_U11, K_K05
EU_06	criticlly evaluate the experimental data, also presented by others	K_W01, K_U01, K_U10, K_K01, K_K05

4. Learning content with reference to course learning outcomes (EU)

Course learning content	Course learning outcome symbol (EU)
The basic knowledge on nucleic acid structure, function and validity in environmental studies.	EU_01, EU_02, EU_02
The basic knowledge on protein structure, function and validity in environmental studies.	EU_01, EU_02, EU_03
Application of nucleic acids in environmental studies and suitable methods: cloning, PCR, Real-time PCR; microarrays, genotyping (SNP i RLFP); Sanger and NGS sequencing. .	EU_03, EU_04, EU_05, EU_05
Application of proteins in environmental studies and suitable methods: protein isolation and purification, electrophoresis, immunodetection, Elisa test, microscope technics, mass spectrometry, protein expression in model organisms.	EU_03, EU_04, EU_05, EU_06

5. Reading list

Wydawnictwa książkowe

1. Jeremy M.Berg, Lubert Stryer, John L.Tymoczko, Gregory J.Gatto: Biochemistry 8e, Freeman & Co, US by W.H., 2015

2. Bruce Alberts, Karen Hopkin, Alexander D.Morgan, David Morgan, Martin Raff, Keith Roberts, Peter Walter : Essential Cell Biology fifth edition, , , 2019

III. Additional information

1. Teaching and learning methods and activities to enable students to achieve the intended course learning outcomes (please indicate the appropriate methods and activities with a tick or/and suggest different methods)

Teaching and learning methods and activities	

Lecture with a multimedia presentation	X
Interactive lecture	X
Problem – based lecture	
Discussions	X
Text-based work	
Case study work	X
Problem-based learning	
Educational simulation/game	
Task – solving learning (eg. calculation, artistic, practical tasks)	
Experiential work	
Laboratory work	X
Scientific inquiry method	X
Workshop method	
Project work	
Demonstration and observation	
Sound and/or video demonstration	
Creative methods (eg. brainstorming, SWOT analysis, decision tree method, snowball technique, concept maps)	
Group work	X

2. Assessment methods to test if learning outcomes have been achieved (please indicate with a tick the appropriate methods for each LO or/and suggest different methods)

Assessment methods	**Course learning outcome symbol**					
	EU_1	**EU_2**	**EU_3**	**EU_4**	**EU_5**	**EU_6**
Written exam	X	X	X			
Oral exam						
Open book exam						
Written test						
Oral test						
Multiple choice test			X			
Project				X		
Essay						X
Report					X	X
Individual presentation						
Practical exam (performance observation)						
Portfolio						

3. Student workload and ECTS credits

Activity types	**Mean number of hours spent on each activity type**

Contact hours with the teacher as specified in the study programme	30
Preparation for classes	20
Reading for classes	5
Essay / report / presentation / demonstration preparation, etc.	10
Project preparation	10
Term paper preparation	
Exam preparation	15
Total hours	90
Total ECTS credits for the course	3

4. Assessment criteria according to AMU in Poznan grade system

Very good (bdb; 5,0): Clear attainment of the course outcomes, showing complete and comprehensive understanding of the course content, with development of relevant skills and intellectual initiative to an extremely high level.
Good plus (+db; 4,5): Substantial attainment of the course outcomes, showing a high level of understanding of the course content, with development of relevant skills and intellectual initiative to a high level.
Good (db; 4,0): Sound attainment of the course outcomes, showing good understanding of the course content, with development of relevant skills and intellectual initiative to good level.
Satisfactory plus (+dst; 3,5): Some attainment of the course outcomes, showing some understanding of the course content, with development of relevant skills and intellectual initiative to rather good level.
Satisfactory (dst; 3,0): Weak attainment of the course outcomes, showing acceptable understanding of the course content, with development of relevant skills and intellectual initiative to acceptable level.
Unsatisfactory (ndst; 2,0): Very weak attainment of the course outcomes, showing not passable understanding of the course content, with development of relevant skills and intellectual initiative to not acceptable level.