

Description of the education module/course (syllabus)

Course name:	Molecular Biology		ECTS	3
Translation of the course name into English:	-			
Study field:	General Horticulture			
Language of lectures:	English		Study level: Master of science	
Study form: <input checked="" type="checkbox"/> stationary <input type="checkbox"/> extramural	Status of lectures: <input checked="" type="checkbox"/> primary <input type="checkbox"/> directional	<input checked="" type="checkbox"/> obligatory <input type="checkbox"/> facultative	Semester number: 1	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> spring semester
Academic year from which the description applies		2021/2022	Catalog number:	OGR-O2-S-1104 ang
Course coordinator:	Prof. dr hab. Grzegorz Bartoszewski			
Lecturers:	Prof. dr hab. Grzegorz Bartoszewski, dr Ewa Siedlecka, and other faculty staff			
Unit running the course:	Department of Plant Genetics Breeding and Biotechnology			
Unit ordering the course:	Faculty of Horticulture			
Assumptions, objectives and description of the course:	<p>This course provides basic knowledge and laboratory practice in molecular biology. The student will acquire knowledge about organization, maintenance, and expression of genetic information at the molecular level. Student will be introduced to and get familiar with the basic equipment, methods and principles of the work in the laboratory of the molecular biology. The course will shape and extend the skills of independent and team work and the interpretation of the experimental results. Lectures address the following topics: 1. Introduction to molecular biology, 2. Structure and properties of nucleic acids. 3. DNA packing in prokaryotes and chromatin structure in eukaryotes. 4. Basics of DNA replication. 5. DNA mutations and repair mechanisms. 6. Introduction to transcription. 7. Regulation of gene expression – examples of mechanisms. 8. The structure of ribosomes. 9. The basics of translation. 10. Posttranslational protein modifications and degradation. Laboratory course is focused on molecular biology methods and techniques. 1. DNA isolation and purification. Evaluation of the DNA quality and quantity. 2. Polymerase chain reaction (PCR). Reaction preparation and content. Cycler programming. PCR primer designing. Melting and annealing temperatures. PCR variants. 3. PCR products agarose electrophoresis. Methods of electrophoresis. Molecular weight standards. Elution of the PCR products. DNA preparation for sequencing.</p>			
Didactic forms, number of hours:	Lectures - 15h Laboratory course - 15h			
Teaching methods:	The lectures and will be given as multimedia presentations. Laboratory course will be provided in fully equipped molecular biology laboratory. Discussion section focused on the performed experiments will be included.			
Formal requirements and prerequisites:	Basic knowledge of components of the cell and organelles and what are their functions. Basic knowledge of genetics. Before this course students should pass biochemistry and genetics courses.			
Learning outcomes:	Knowledge: W_01- student knows the basic molecular mechanisms of genetic information maintenance W_02- student describes common tools and used in molecular biology	Skills: U_01- student have skills to perform basic experiments in molecular biology laboratory under supervision U-02 – student describes and interpret the results of simple molecular biology experiment	Competences: K_01- student recognizes the potential of molecular biology and knows examples of their practical application	
The way of verification of learning outcomes :	W_01 – written exam score W_02 – written exam and section tests scores U_01 – score from the laboratory experiment report U_02 – score from the laboratory experiment report K_01 – score of written exam and section tests			
Form of documentation of achieved learning outcomes :	Section tests related to the laboratory course. Reports from laboratory experiments Written final exam.			
Elements and weights affecting the final grade:	Learning outcomes verification is based on: (1) scores of the section tests (2) score of the laboratory report (3) store of the final written exam. Each learning outcome should be verified and 51% of the points has to be scored. Final grade is calculated based on each verification element score and its weight. Weights of the verification scores are: (1) section tests 45%, (2) laboratory experiment report 5%, (3) final exam 50%.			
Place of classes:	Lecture hall with PC and multimedia projector Molecular biology laboratory			
Basic and supplementary literature :	1. Allison L.A. (2010) Fundamental molecular biology Blackwell Publishing 2. Brown T.A. (2017) Genomes 4. Garland Science 3. Turner P.C., McLennan A.G., Bates A.D., White M.R.H. (2000) Molecular biology. Instant Notes.			
COMMENTS	None			

Quantitative indicators characterizing the module / object:

Estimated total number of student work hours (contact and own work) necessary to achieve the assumed learning outcomes - on this basis, complete the ECTS field:	70 h
The total number of ECTS points that a student receives in classes requiring direct participation of academic teachers or other lecturers:	1.5 ECTS

Table of compliance of the directional learning outcomes with the effects of the course:

Effect category	Learning outcomes for the course:	Reference to learning outcomes specific for study program on particular study field (direction)	The impact of course on the directional effect ^{*)}
W_01	student knows the basic molecular mechanisms of genetic information maintenance	K_W01, K_W03	3, 2
W_02	student describes common tools and used in molecular biology	K_W04, K_W06	3, 2
U_01	U_01- student have skills to perform basic experiments in molecular biology laboratory under supervision	K_U01, K_11	2, 1
U_02	student describes and interpret the results of simple molecular biology experiment	K_U01	2
K_01	student recognizes the potential of molecular biology and knows examples of their practical application	K_K01	2

*)

3 – znaczący i szczegółowy,

2 – częściowy,

1 – podstawowy,