INFORMATION ABOUT THE COURSE

1. Basic information

Course name	**Agrobiotechnology**
Field of study	Agriculture
Study level	Second cycle
Study profile	Academic
Study form	Full time
Speciality	Agronomy and Agribusiness Environmental Management
Unit running the course	Department of Ornamental Plants and Vegetable Crops
Name(s) and scientific degree(title) of teacher(s)	Justyna Lema-Rumińska, PhD; Natalia Miler, PhD; Alicja Tymoszuk, PhD
Introductory courses	Botany, Plant Physiology, Biochemistry
Prerequisites	Basic knowledge of plant histology and plant's growth regulators

2. Semester schedule of classes

Semester	Lectures	Classes	Laboratories	Project classes	Seminars	Field practice	ECTS
I	20		30				5

3. EDUCATIONAL OUTCOMES (acc. to National Qualification Framework)

No.	Description of the outcomes	Reference to the major specific outcomes of education	Reference to the area specific outcomes of education
KNOWLEDGE			
W1	Student has extended knowledge of biology. Student is able to define and explain the biological basis of agricultural biotechnology.	K_W01	R2A_W01
W2	Student can list and classify basic methods and tools used in agricultural biotechnology.	K_W09	R2A_W05
SKILLS			
U1	Student is able to design and conduct research in agricultural biotechnology, as well as properly interpret the results.	K_U04	R2A_U04
U2	Student is able to observe and explain the phenomena and reactions of plants in in vitro cultures.	K_U05	R2A_U05
SOCIAL COMPETENCES			
K1	Student perceives risks and hazards arising from the practical use of agricultural biotechnology in agricultural production. Student has knowledge of the standards and rules limiting such risks.	K_K04	R2A_K05 R2A_K06

4. TEACHING METHODS

Multimedia lecture, lab

5. METHODS OF EXAMINATION

Written exam, colloquium or tests

6. TEACHING CONTENTS

Lectures	Economic and environmental aspects of in vitro cultures in plant production. Contamination in in vitro cultures – methods of identification and elimination. The importance of biotechnology for conservation of genetic resources. Construction and isolation meristem. Culture and protoplasts fusion. Secondary metabolites - plant pigments. The creation of new cultivars of crop plants. The application of biotechnology in mutation breeding. Separation of chimeras. The identification of cultivars with the application of modern methods of molecular biology and chemotaxonomy. Legislation of biotechnology.
Labs	OSH regulations in laboratory of in vitro cultures. Construction and equipment of production laboratory cultures in vitro. The composition of the media for in vitro culture. Design media for the different species of plants. Juvenility and genetic stability of explants. Stages of micropropagation. Modern methods and techniques for the cloning of plant material of the highest quality using in vitro cultures: single – node method, auxiliary buds method, adventitious buds method, somatic embryogenesis. Artificial seeds formation. Micropropagation technology for selected plant species.

7. VALIDATION OF LEARNING OUTCOMES

Outcome	Evaluation form					
	Oral Exam	Written Exam	Colloquium	Project	Report	Other
W1		x				x
W2		x				x
U1						x
U2						x
K1		x				

8. LITERATURE

Basic literature	Borem A., Fritsche-Neto R. (eds.) 2014. Biotechnology and Plant Breeding, Academic Press,San Diego. George E. F. (eds.) 2008. Plant Propagation by Tissue Culture, Springer, Berlin. Pierik R.L.M. 1987. In vitro Culture of Higher Plants. Martinus Nijhoff Publisher The Netherlands.
Supplementary literature	Biotechnology, Journal of Biotechnology, Computational Biology and Bionanotechnology.

9. STUDENT'S WORK – BALANCE OF HOURS AND ECTS POINTS

Student's performance	Number of hours
Class attendance specified in p. 2	50
Involvement in classes	10
Study of literature	15
Others (preparation for exams, tests, engagement in projects etc.)	25
Student's total performance	25
Number of points proposed by NA	125
Final number of ECTS points (determined by the Educational Board)	5