

Course title: In vitro plant tissue cultures		
Programme: Biotechnology		Code: 3.3
Type of course:	Course level: II degree	Semester: II
Form of classes: Lecture, laboratory	Number of hours per week/meeting: 15 L, 30L	Credit points: 4 ECTS
Education profile: academic		Course language: English
Enrolment: no		

GUIDE TO THE SUBJECT

I. COURSE CHART

COURSE OBJECTIVES

- C.1.** Understand the basic techniques and principles of cell and tissue culture and their applicability
- C.2.** Acquire the ability to cultivate cells and tissues
- C.3.** Awareness of the need for development and self-education and ethical behavior with biological material

PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of the basics of chemistry and biology
2. Knowledge of biochemistry

LEARNING OUTCOMES

EU 1- Student knows the types and methods of cell and tissue culture, knows the principles of working in vitro and knows the possibilities of using cells and tissues

EU 2 - Student knows how to use in vitro cell culture and tissue culture methods, performs simple experiments in the field of explant culture

EU 3 - The student is aware of the need to constantly improve and acquire modern professional skills, is willing, including ethical, and ability to work in the group and in the future workplace related to the subject

COURSE CONTENT

Form of classes - lectures	Hours
Introduction to tissue technology, cell and tissue culture	1
Prevention of primary and secondary pollution	1
Technology of plant tissues	2
Animal tissue technology	1
Tissue engineering- perspectives and challenges	1
Stem cells	1
Biotechnology of tuberous roots	1
Technological aspects of bioreactor cultures	1
Optimization of regeneration of transgenic shoots	1
Selection and testing	1
Micropropagation technologies of plants	2
Exam	2
Form of classes - laboratory	Hours
Introduction to laboratory exercises. General safety rules and regulations	1
Principles of working with tissue and cell cultures, equipment, manual exercises	4
Preparing substrates and growth media	4
Establishment of auxetic cultures	4
Micropropagation of plant tissues	4
Organogenesis; callus cultures, effect of growth regulators	6
Transplant procedures (passage) of the explantats	5
Final test	2

COURSE STUDY METHODS

1. multimedia presentation
2. devices and equipment used in the laboratory
3. information panels and educational guides

METHODS OF ASSESMENT (F - formative; S - summative)

F1. – activity in classes
F2. – evaluation of laboratory exercises
S1. – exam

S2. – test

STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	15 h
Participation in classes	- h
Laboratory	30 h
Participation in project classes	- h
Participation in seminar	- h
Preparation course on e-learning	- h
Test	2 h
Entrance test for laboratory classes	h
Project's defence	- h
Exam	2 h
Consultation hours	5 h
DIRECT TEACHING, hours/ ECTS	54 h / 2.5 ECTS
Preparation for tutorials	- h
Preparation for laboratories	10 h
Preparation for projects	- h
Preparation for seminars	- h
Preparation for e-learning classes	- h
Participation in e-learning classes	- h
Working on project	- h
Preparation for tests	10 h
Preparation for exam	20 h
SELF-STUDY, hours/ ECTS	40 h / 1.5 ECTS
TOTAL (hours)	∑ 94 h
TOTAL ECTS	4 ECTS

PRIMARY AND SUPPLEMENTARY TEXTBOOKS

1. Bhojwani S.S., Razdan M.K. 1996. Plant Tissue Culture: Theory and practice, a Revised edition. Elsevier.
2. Hall R.D. 1999. Plant Cell Culture Protocols. Humana Press.
3. Plant Tissue Culture 3rd Edition, Techniques and Experiments, Authors: Roberta Smith eBook ISBN: 9780124159853, Paperback ISBN: 9780124159204, Imprint: Academic Press Published Date: 20th July 2012

Research papers

SUBJECT COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)

1. dr Anna Grobelak, agrobelak@is.pcz.czest.pl

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NAME OF LECTURER (s) (NAME, SURNAME, E-MAIL ADDRESS)

dr Anna Grobelak, agrobelak@is.pcz.czest.pl
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Learning outcome	In relation to the learning outcomes specified for the field of study	Course objectives	Course content	Course study methods	Methods of assesment
EU1	K_W01, K_W02, K_U02, K_U06, K_K03	C1	Lecture/laboratory	1,2,3	F1, F2, S1, S2
EU2	K_W01, K_W02, K_U02, K_U06, K_K03	C1,C2	Lecture	1,3	F2, S1, S2
EU3	K_W01, K_W02, K_U02, K_U06, K_K03	C3	Lecture	1,3	F2, S1, S2

II. OTHER USEFUL INFORMATION

1. All the information on the class schedule is posted on the student information board and online at: www.is.pcz.pl
2. The information about the consultation hours is provided to students on the first class meeting and posted online at: www.is.pcz.pl
3. The information on course completion and grade is provided to students on the first class meeting.