Annex 6

DISCIPLINE DESCRIPTION

1. Information on the study programme

1.1 Academic institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**FACULTY OF ENVIRONMENTAL PROTECTION**
1.3 Department	**AGRICULTURE, HORTICULTURE**
1.4 Field of study	**HORTICULTURE**
1.5 Cycle of study	**BACHELOR**
1.6 Study programme/Qualification	**LANDSCAPE ARCHITECTURAL/ ENGINEER**

2. Information on the discipline

2.1 Name of discipline	**HORTICULTURAL BIOTECHNOLOGIES**						
2.2 Course holder	**VIDICAN IULIANA TEODORA**						
2.3 Seminar/Laboratory/Project holder	**BORZA IOANA MARIA**						
2.4 Year of study	III	2.5 Semester	5	2.6 Type of evaluation	Ex	2.7 Regime of discipline	O

(C) Compulsory; (O) Optional; (E) Elective

3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	3	out of which: 3.2 course	2	out of which 3.3 seminar/laboratory/project	1
3.4 Total hours in the curriculum	42	out of which: 3.5 course	28	out of which 3.6 seminar/laboratory/project	14

Time allotment	hours
Study assisted by manual, course support, bibliography and notes	**14**
Additional documentation in the library/ on specialised electronic platforms and in the field	**10**
Preparation of seminars/laboratories/ topics/reports, portfolios and essays	**8**
Tutorship	
Examinations	**3**
Other activities.....	**35**
3.7 Total hours of individual study	**35**
3.9 Total hours per semester	**42**
3.10 Number of credits	**3**

4. Prerequisites (where appropriate)

4.1 curriculum	(Conditionings) Knowledge of botany, genetics, plant physiology.
4.2 competences	Knowledge of plant morphology, anatomy and physiology, but also of plant genetics.

5. Conditions (where appropriate)

5.1. related to course	Video projector, computer.
5.2. related to	-Equipment and equipment related to laboratory hours;

seminar/laboratory/ project	- Knowledge of the notions contained in the laboratory work to be performed (synthesis material); - Carrying out all laboratory work.

6. Specific competences acquired	
Professional competences	▪ C1. Substantiation of the sustainable management of the forest fund, of the hunting fund, salmonic fund and of the biodiversity conservation ▪ C2. Elaboration and implementation of technical-economic projects regarding the regulation of the forestry, hunting and salmon production process
Transversal competences	▪ **CT1.** Elaboration and observance of a work program and accomplishment of one's own attributions with professionalism and rigor

7. Objectives of discipline (coming from the specific competences acquired)

7.1 General objective	▪ Course objectives: Knowledge and understanding of metabolic processes of organisms that constitute the theoretical and practical basis for the development of biotechnologies. Students learn the values of biotechnology, which lies in the fact that it is a tool applicable in various economic sectors
7.2 Specific objectives	▪ Forming a global vision on biotechnologies seen as a complex of modern disciplines aimed at obtaining useful products through the exploitation of biological systems. Familiarization of students with the fundamental theoretical and practical principles of classical and molecular biotechnologies. Knowledge of the physiological, biochemical and molecular mechanisms by which in vitro culture is possible. Learning the main notions related to tissue and cell culture technology. Knowledge of the applications of biotechnological processes in everyday life.

8. Content*/

8.1 Course	Methods of teaching	No. of hours/Remarks
1. Introduction. Brief history of plant biotechnologies internationally and in Romania.	Exposure. Conversation. Explanation. Debate. Interactive course. Video Overhead Projector	**2 ore**
2. Plant vitrocultures and their type. Basic principles.	Idem	**2 ore**
3. Culture media. Compounds used in the production of culture media. Inorganic compounds. Organic compounds.	Idem	**2 ore**

4. Culture media. Compounds used in the production of culture media. Organic compounds - phytohormones.	Idem	**2 ore**
5. Culture media. Compounds used in the production of culture media. Phenolic compounds and other specific substances.	Idem	**2 ore**
6. Chromophytoinucules. General considerations.	Idem	**2 ore**
7. Criteria for selecting plant material for viticulture.	Idem	**2 ore**
8. Inoculation, incubation, directed crop growth, subculturing or transplanting.	Idem	**2 ore**
9. Acclimatization of vitroplants.	Idem	**2 ore**
10. Technique of cultures of plant cells, callus and cell suspensions.	Idem	**2 ore**
11. Isolation of plant cells cultured in vitro in the form of cell suspensions.	Idem	**2 ore**
12. Large-scale culture of plant cells.	Idem	**2 ore**
13. Cryostocking of protoplasts.	Idem	**2 ore**
14. The perspective of plant cell cultures.	Idem	**2 ore**
Bibliography 1. Albert Sasson, 1993 - Biotehnologii si dezvoltare, Editura Tehnica, Bucuresti; 2. Dorina Cachita Cosma, Aurel Ardelean, C. Craciun, 1997 - Actualitati si perspective in biotehnologiile vegetale, Editura Vasile Goldis, Arad; 3. Dorina Cachita Cosma, Constantin Deliu, Lenuta Rakosy-Tican, Aurel Ardelean, 2004 – Tratat de biotehnologie vegetala, vol.I, Eeditura Dacia, Cluj-Napoca.		
8.2 Seminar	Methods of teaching	No. of hours/ Remarks
8.3 Laboratory		
1. Introduction. Arranging an in vitro culture unit.	In the first laboratory class, the coordinator of the laboratory works and the notions related to the labor protection specific to the laboratory of plant physiology will be presented.	**2 ore**
2. Arrangement of an in vitro culture unit - non-sterile area.	- Carrying out the practical works individually with the help of the practical works guide -following experiences and interpreting the results obtained, where appropriate.	**2 ore**
3. Arrangement of an in vitro culture unit - sterile area.	Idem	**2 ore**
4. Asepsis and asepsis.	Idem	**2 ore**
5. Preparation of culture media for plant explants, sterilization of media and laboratory utensils.	Idem	**2 ore**
6. Preparation of decimal, successive dilutions and inoculation on culture media.	Idem	**2 ore**
7. Observation of microbial cultures under a	Idem	**2 ore**

microscope.		
8. Selection of plant material for viticulture and inoculation.	Idem	**2 ore**
9. Selection of plant material for viticulture and inoculation, in parallel with the follow-up of the directed growth of vitroplants.	Idem	**2 ore**
10. Selection of plant material for viticulture and inoculation, in parallel with the follow-up of the directed growth of vitroplants.	Idem	**2 ore**
11. Subcultivation or transplanting of vitroplants.	Idem	**2 ore**
12. Subcultivation or transplanting of vitroplants.	Idem	**2 ore**
13. Acclimatization of vitroplants.	Idem	**2 ore**
14. Verification of knowledge	Idem	**2 ore**
8.4 Project		
Bibliography Blidar C., Petruș A., 2005, Biotehnologii – lucrări de laborator. Editura Universității din Oradea		

* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme

The content of the discipline is adapted and satisfies the requirements imposed by the labor market, being agreed by the social partners, professional associations and employers in the field related to the bachelor program. The content of the discipline can be found in the curriculum of the study program in the field of Horticulture and in other university centers in Romania that have accredited these specializations.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	- For note 5: all topics should be treated minimum standards; For notes> 5: all topics should be treated at the maximum standards	Written or oral exam - duration 2 hours.	60 %
10.5 Seminar			
10.6 Laboratory	Making documentation for the chosen theme, details and case study. The presentation of the topic studied will be done in powerpoint.	All laboratory work must be performed, provided you enter the exam. - The weight of the laboratory is 40% of the value of the exam grade. - Only one remaining laboratory is allowed to be recovered (in the last week of the semester)	40 %
10.7 Project			

10.8 Minimum standard of performance
Performing works under the supervision of a teacher, to solve specific problems landscape design, with the correct assessment of the workload, the resources available and the time needed for completion.

Date of completion	Signature of course holder**	Signature of seminar laboratory/project holder **
01.10.2021	S.l. dr.ing. **VIDICAN Iuliana Teodora** iuliateodora68@yahoo.com	S.l. dr.ing. **BORZA Ioana Maria** borzaioanamaria@yahoo.com

Date of approval in the department	Signature of the Head of Department
Prof.univ. dr.ing. **BANDICI Emil Gheorghe** gbandici@yahoo.com	Prof.univ. dr.ing. **CHEREJI Ioan** cherejii@yahoo.com

** - Name, first name, academic degree and contact details (e-mail, web page, etc) will be specified.
*** - Name, first name, academic degree and contact details (e-mail, web page, etc) of the academic entity beneficiary of the Discipline Outline will be specified.