



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Izbrana poglavja iz rastlinskih tkivnih kultur
Course title: Selected Topics from Plant Tissue Cultures

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja	/	1. ali 2.	1.- 4.;
Doctoral Study Ecological Sciences, 3rd degree	/	1 st or 2 nd	1 st - 4 th

Vrsta predmeta / Course type

Izbirni/Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
15	15				150	6

Nosilec predmeta / Lecturer:

Jana AMBROŽIČ-DOLINŠEK

Jeziki /

Languages:

Predavanja / Lectures: slovenski / Slovene

Vaje / Tutorial: slovenski / Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Poznavanje botanike in fiziologije rastlin na ravni dodiplomskega programa prve stopnje ter ekofiziologije rastlin na ravni magistrskega programa druge stopnje.

Prerequisites:

Knowledge of botany and plant physiology at graduate level and plant ecophysiology at master level.

Vsebina:

Content (Syllabus outline):

Biologija gojenja rastlinskih celic ter načini in uporaba rastlinskih tkivnih kultur v znanosti in v tržne namene.

Predmet v prvem delu obravnava tehnične pogoje za vzgojo rastlinskih tkivnih kultur. V drugem delu obravnava različne možnosti uporabe rastlinskih tkivnih kultur: mikropropagacije, somatske embriogeneze, eliminacija virusov, krioprezervacija ter pridobivanje sekundarnih metabolitov.

The biology of plant cell cultures and principles and application of plant tissue culture in research and commercial production.

The course in the first part introduces technical requirements for plant tissue cultures. In the second part present different applications of plant tissue cultures: micropropagation, somatic embryogenesis, virus elimination, cryopreservation, and secondary metabolites production.

Temeljni literatura in viri / Readings:

Bohanec B. (1992) Tehnike rastlinskih tkivnih kultur. Biotehniška fakulteta, Ljubljana.

Pierik R.L.M. (1997) In vitro culture of higher plants. Kluwer Academic Publishers. Dordrecht.

Raspor, P. (ur.). (1996) Biotehnologija, Osnovna znanja. BIA, Ljubljana

Thomas B. (ur.). (2003) Encyclopedia of applied plant sciences. Elsevier, Academic press, Amsterdam.

Chawla H.S. (2009) Introduction To Plant Biotechnology. Oxford & IBH Publishing Company Pvt. Limited

Chawla H.S. (2003) Plant biotechnology: practical approach. Science Publishers, Enfield.

George E.F. (1993) Plant propagation by tissue culture: Part 1: The technology, Part 2: In practice. Exegetics Limited, Edington.

George E. F., Hall M. A. in De Klerk, G.J. (Eds.) (2008) Plant Propagation by Tissue Culture. Vol 1 and Vol 2. Exegetics, Basingstoke, UK

Trigiano R.N. in Gray D.J. (2011) Plant tissue culture concepts and laboratory. CRC Press, Boca Raton.

Kleyn J., Scoggins H. in Bridgen M. (2013) Plants from Test Tubes: An Introduction to Micropropagation. Timber Press

Izbrani članki iz znanstvenih revij.

Cilji in kompetence:

- Seznaniti študente s tehničnimi zahtevami vzgoje rastlin v tkivni kulturi.
- Pregledno seznaniti študente z različnimi načini uporabe rastlinskih tkivnih kultur v znanosti in v komercialne namene.
- Praktično usposobiti študenta za aseptično delo z rastlinami.

Objectives and competences:

- To acquaint students with the technical requirements for plant cultivation in tissue culture.
- To give an overview through the different ways of using plant tissue culture in research and commercial production.
- Practically prepare students to the aseptic work with plants.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Pojasni tehnične zahteve vzgoje rastlin v tkivni kulturi kot so: priprava vcepkov in gojišč, rastlinskih rastnih regulatorjev, hormoni, značilnosti gojenja rastlin v tkivni kulturi
- Pojasni organogenezo, embriogenezo.

Intended learning outcomes:

Knowledge and understanding:

- Explain the technical requirements for the cultivation of plants in tissue culture, such as: preparation of explants and growth media, plant growth regulators, hormones, cultivation of plants in tissue culture
- Explain organogenesis, embryogenesis.

- Ovrednoti razlike med različnimi tipi tkivnih kultur.
- Pojasni različne načine pridobivanja sekundarnih metabolitov.
- Pojasni postopek korioprezervacije.
- Predlaga in ovrednoti izbiro ustreznega gojišča, metodo mikropropagacije in ex situ strategijo varstva za rastlinsko vrsto.

- Evaluate differences between different types of tissue culture.
- Explains the differences in the production of secondary metabolites.
- Explain the procedure for cryopreservation.
- Propose and evaluate the selection of the appropriate medium, the micropropagation method and the ex situ protection strategy for the plant species.

Metode poučevanja in učenja:

Predavanja s študijami primerov
Seminar

Learning and teaching methods:

Lectures with case studies
Seminar

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt):	50	Type (examination, oral, coursework, project):
Pisni izpit	50	Exam
Seminarska naloga		Seminar work

Reference nosilca / Lecturer's references:

AMBROŽIČ-DOLINŠEK, Jana, CIRINGER, Terezija, KALIGARIČ, Mitja. Micropropagation of the narrow endemic *Hladnikia pastinacifolia* (Apiaceae). *Acta botanica Croatica*, ISSN 0365-0588, 2016, vol. 75, iss. 2, str. 244-252, ilustr., doi: [10.1515/botcro-2016-0028](https://doi.org/10.1515/botcro-2016-0028). [COBISS.SI-ID [22339592](https://www.cobiss.si/id/22339592)], [JCR, SNIP, WoS do 4. 11. 2016: št. citatov (TC): 0, čistih citatov (CI): 0, Scopus do 30. 11. 2016: št. citatov (TC): 0, čistih citatov (CI): 0]

MECHORA, Špela, ŽERDONER ČALASAN, Anže, FELICIJAN, Mateja, URBANEK KRAJNC, Andreja, AMBROŽIČ-DOLINŠEK, Jana. The impact of selenium treatment on some physiological and antioxidant properties of *Apium repens*. *Aquatic botany*, ISSN 0304-3770. [Print ed.], 2016, 1-8, doi: [10.1016/j.aquabot.2016.12.002](https://doi.org/10.1016/j.aquabot.2016.12.002). [COBISS.SI-ID [22874888](https://www.cobiss.si/id/22874888)], [JCR, SNIP, Scopus do 27. 1. 2017: št. citatov (TC): 0, čistih citatov (CI): 0]

MECHORA, Špela, SOTLER, Metka, URBANEK KRAJNC, Andreja, AMBROŽIČ-DOLINŠEK, Jana. How selenium affects *Berula erecta*. *Water, air and soil pollution*, ISSN 0049-6979. [Print ed.], 2016, vol. 227, iss. 12, str. 1-12, doi: [10.1007/s11270-016-3150-2](https://doi.org/10.1007/s11270-016-3150-2). [COBISS.SI-ID [22790408](https://www.cobiss.si/id/22790408)], [JCR, SNIP, WoS do 20. 1. 2017: št. citatov (TC): 0, čistih citatov (CI): 0, Scopus do 3. 12. 2016: št. citatov (TC): 0, čistih citatov (CI): 0]