

Module Descriptions

Module designation	Tissue Culture Technique (course code MPB 4141)
Semester(s) in which the module is taught	6 th semester of Bachelor Programme in Biology
Person responsible for the module	Dr. Zulfa Zakiah, S.Si., M.Si
Lecture (s)	Dr. Zulfa Zakiah, S.Si., M.Si Mukarlina, S.Si., M.Si.
Language	Indonesia
Names of other study programmes with which the module is shared	-
Relation to curriculum	Elective course
Teaching methods	Lecture, project, and practical sessions
Workload (incl. contact hours, self-study)	Total workload: 7.06 ECTS • Lecture: 26,6 hours (0,99 ECTS) • Assignment: 60.1 hours (2.23 ECTS) • Self-study: 56 hours (2.07 ECTS) • Practical sessions: 47.8 hours (1.77 ECTS) Practical sessions will complement and reinforce the concepts that are taught in the lectures by providing hands-on experience to apply the theoretical knowledge gained).
Credit points	3 credits
Required and recommended prerequisites for joining the module	Students have taken Plant Physiology (MPB 3225)

Module objectives/intended learning outcomes	Intended Learning Outcomes (ILO) Knowledge (ILO-2) Able to integrate and apply biological science and other scientific fields that support the development of biological science. General Skill (ILO-3) Able to collaborate effectively within a team and to communicate actively, both orally and in writing, in the domain of biology. General Skill (ILO-4) The ability to engage in critical, creative, and innovative thinking, coupled with a commitment to lifelong learning in the fields of biological science and entrepreneurship. Specific Skill (ILO-6) Able to apply biological methodology and use instruments by prioritising work safety and able to apply in the management of tropical wetland resources. Course outcomes (CO) CO 12. Students are able to employ molecular biology, biotechnology, and bioinformatics techniques to address challenges in the advancement of biological sciences. CO 14. Students are able to apply the principles of microbiology, zoology, and botany to facilitate the utilization of biological resources and the development of biologically-based products. CO 17. Students are able to collaborate within a team to successfully complete case studies or projects in the field of biology and to present the findings effectively. CO 18. Students are able to systematically compile and communicate biological research findings based on valid data across various scientific communication formats, including scientific reports, articles, posters, and oral presentations. CO 23. Students are able to identify opportunities and formulate creative and innovative solutions that address societal and environmental needs, particularly in the fields of biotechnology and conservation. CO 27. Students are able to operate biological instruments and methodologies by prioritising work safety in the observation and measurement of biological and environmental objects.
Content	Tissue culture techniques learn about the basic concepts of tissue culture, laboratory and tissue culture equipment, aseptic techniques, tissue culture media, organ culture, callus culture, suspension culture, haploid plant culture and protoplast culture and the production of secondary metabolites through tissue culture
Examination forms	- Theory 70% (project study method) - Midterm 20% - Final Exams 20% - Assignment 50% - Activity 10% - Lab works 30%
Study and examination requirements	75% attendance

Reading list	1. Amin, M., & Putri, R. N. (2023). Dasar-dasar Kultur Sel dan Jaringan Tumbuhan. Universitas Gadjah Mada Press. 2. Bhojwani, S.S. & P.K. Dantu. 2013. Plant Tissue Culture: An Introductory Text. Springer. New Delhi 3. Mohan Jain, S. and S.J. Ochatt. 2010. Protocols for In Vitro Propagation of Ornamental Plants. Humana Press Inc. London. 4. Goerge, E.F., M.A. Hall & G.J. De Klerk. 2008. Plant Propagation by Tissue Culture.3rd Edition.Volume 1. The Background. Springer. Netherlands. 5. Dixon, RA & Gonzales, RA, 2006, Plant Culture: A Practical Approach, IRL Press, Oxford, Washington DC. 6. Koelling, Clive. (2017) New Frontiers in Plant In Vitro Culture. Academic Pages. New York. USA 7. Loyola-Vargas, V.M & F. Vazquez-Flota. Plant Cell Culture Protocols: Methods in Molecular Biology. 2nd Edition.Humana Press. New Jersey 8. Sudirman, A., & Haryono, E. (2022). Kultur Jaringan Tumbuhan: Teori dan Praktik. Deepublish. 9. Zakiah Z, & Mukarlina. (2024). Teknik Kultur Jaringan. Untan press. Pontianak. 10. Zakiah Z., & Turnip M. (2024). Induction of Somatic Embryogenesis of Pontianak Siamese Orange Cotyledon Cultures on Murashige Skoog Media with the Addition of 2,4-D and Kinetin. Jurnal Biologi Tropis, 24(2): 241-250
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