



USK
UNIVERSITAS
SYIAH KUALA

FACULTY OF AGRICULTURE
DEPARTMENT OF SOIL SCIENCE

UNDERGRADUATE PROGRAM

MODULE HANDBOOK

Module designation	Practicum of Soil Bioremediation (SSOL6018)
Semester(s) in which the module is taught	6 th semester
Person responsible for the module	Dr. Ir. Fikrinda, M.Si.
Language	Indonesian, English
Relation to curriculum	Elective module for Soil Science Department
Teaching methods	Practice (field practice/ lab practice)
Workload (incl. contact hours, self-study hours)	✓ 170 minutes practice per week (field/laboratory 50 minutes; structured learning 60 minutes; 60 minutes self study)
Credit points	1 SKS = 1.6 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ul style="list-style-type: none">✓ Students are able to design and implement bioremediation experiments on contaminated soil using a local resource-based biological approach to support sustainable agriculture.✓ Students are able to analyze the effectiveness of bioremediation and compile scientific reports and technical recommendations based on soil and water conservation principles.
Content	This course provides practical skills in the application of soil bioremediation techniques, including the isolation and characterization of soil microorganisms with bioremediation potential, the design and implementation of bioremediation experiments, and the analysis, evaluation, and interpretation of bioremediation results, as well as the presentation of practical findings.
Exams and assessment formats	Case method, team based project, quiz, assignment, exam
Study and examination requirements	<ul style="list-style-type: none">✓ Case method: 20%✓ Team based project: 50%✓ Quiz: 5%✓ Assignment: 15%✓ Exam: 10%

Reading list	<ol style="list-style-type: none">1. Bhattacharya, A., Fathima, J., Varghese, S., Chatterjee, P., and Gadhamshetty, V. 2025. Advances in bioremediation strategies for PFAS-contaminated water and soil. <i>Soil and Environmental Health</i>. 3(1): 1001262. Matilda, M.I. & Samuel, H.S. 2024. Bioremediation of oil spill : concept , methods and applications. <i>Discover Chemistry</i> 1(41): 1-183. Omotayo, A.O. & Omotayo, O.P, 2024. Potentials of microbe-plant assisted bioremediation in reclaiming heavy metal polluted soil environments for sustainable agriculture. <i>Environmental and Sustainability Indicators</i> 22: 1003964. Qattan, Shaza Y.A. 2025. Harnessing bacterial consortia for effective bioremediation: targeted removal of heavy metals, hydrocarbons, and persistent pollutants. <i>Environmental Sciences Europe</i> 37(85):1-355. Shah, S.M., Khan, S., Bibi, N., Rehman, B., Ali, R., Shireen, F., Yilmaz, S. Ali, Q., Ullah, A., & Ali, D.. 2025. Indigenous bacteria as potential agents for trace metal remediation in industrial wastewater. <i>Scientific Reports</i> 15(1): 1-22
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