



**USK**  
UNIVERSITAS  
SYIAH KUALA

**FACULTY OF AGRICULTURE**  
**DEPARTMENT OF SOIL SCIENCE**

**UNDERGRADUATE PROGRAM**

**MODULE HANDBOOK**

Module designation	Practicum of Soil Physic (SSOL2019)
Semester(s) in which the module is taught	3 <sup>rd</sup> semester
Person responsible for the module	Prof. Dr. Ir. Darusman, M.Sc
Language	Indonesian, English
Relation to curriculum	Compulsory module for Soil Science Department
Teaching methods	Practice, lecture, presentation
Workload (incl. contact hours, self-study hours)	✓ 170 minutes of 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	SSOL1002
Module objectives/intended learning outcomes	<ul style="list-style-type: none"><li>✓ Students are able to understand and analyze soil physical properties through laboratory and field measurements.</li><li>✓ Students are able to interpret the obtained data to comprehensively understand the characteristics of soil physical properties.</li></ul>
Content	This practicum is designed to provide students with both conceptual understanding and practical skills in the measurement and analysis of soil physical properties. The primary focus is on laboratory and field techniques for identifying soil characteristics, including soil sampling, soil texture, bulk density, particle density ( $\rho_p$ ), soil moisture content, soil porosity, soil permeability, soil water potential (pF), infiltration rate, and soil compaction. Students will be trained to operate laboratory equipment, interpret data, and relate the results of their analysis to sustainable soil management practices.
Exams and assessment formats	Case method, team based project, quiz, assignment, exam
Study and examination requirements	<ul style="list-style-type: none"><li>✓ Case method: 35%</li><li>✓ Team based project: 30%</li><li>✓ Quiz: 10.5%</li><li>✓ Assignment: 10.5%</li><li>✓ Exam: 14%</li></ul>

Reading list	<ol style="list-style-type: none"><li>1. Shukla, M. K. (2023). Soil physics: An introduction. CRC press.</li><li>2. Radcliffe, D. E., &amp; Simunek, J. (2018). Soil physics with HYDRUS: Modeling and applications. CRC press.</li><li>3. Kirkham, M. B. (2023). Principles of soil and plant water relations. Elsevier.</li><li>4. Iwata, S. (2020). Soil-water interactions: mechanisms applications, revised expanded. CRC Press.</li><li>5. Delgado, A., &amp; Gómez, J. A. (2024). The soil: Physical, chemical, and biological properties. In Principles of agronomy for sustainable agriculture (pp. 15-30). Cham: Springer International Publishing.</li><li>6. Dane, J. H., &amp; Topp, C. G. (Eds.). (2020). Methods of soil analysis, Part 4: Physical methods. John Wiley &amp; Sons.</li><li>7. Jones, J. (2018). Soil analysis handbook of reference methods. CRC press.</li></ol>
--------------	---