USK UNIVERSITAS SYIAH KUALA

FACULTY OF AGRICULTURE

DEPARTMENT OF SOIL SCIENCE

UNDERGRADUATE PROGRAM **MODULE HANDBOOK**

Module designation	Soil Chemistry (SSOL2021)
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Prof. Dr. Ir. Sufardi, M.S.
Language	Indonesian, English
Relation to curriculum	Compulsory module for Soil Science Department
Teaching methods	Lecture, presentation, focus group discussion
Workload (incl. contact hours, self-study hours)	✔ Lecture and discussion 100 minutes per week per semester ✔ Structured tasks 120 minutes per week per semester ✔ Personal tasks 120 minutes per week per semester
Credit points	2 SKS = 3.2 ECTS
Required and recommended prerequisites for joining the module	SSOL1002
Module objectives/intended learning outcomes	✔ Students are able to understand and explain the fundamental concepts of soil chemistry, including the composition and structure of soil minerals, clay mineralogy, soil colloids, and soil organic matter, along with their roles in soil chemical processes. ✔ Students are able to describe and analyze key chemical properties and reactions in soils, such as soil pH, cation exchange capacity (CEC), base saturation, nutrient fixation and release, salinity, and redox reactions. ✔ Students are able to conduct laboratory analyses of soil chemical properties and interpret the results to assess soil fertility and chemical behavior.
Content	The course discusses the basic concepts of soil chemistry which include soil chemical composition, mineralogy, chemical processes and reactions as well as soil chemical properties. techniques for analyzing soil chemical properties in the laboratory, and interpretation of laboratory analysis results of soil chemical properties.
Exams and assessment formats	Case method, quiz, assignment, mid term exam, final exam

Study and examination requirements	✔ Case method: 20% ✔ Quiz: 5% ✔ Assignment: 10% ✔ Mid term exam: 10% ✔ Final exam: 25%
Reading list	1. Sparks, D. L., Page, A. L., Helmke, P. A., & Loeppert, R. H. (Eds.). (2020). Methods of soil analysis, part 3: Chemical methods. John Wiley & Sons. 2. Strawn, D. G., Bohn, H. L., & O'Connor, G. A. (2019). Soil chemistry. John Wiley & Sons. 3. Sparks, D. L., Singh, B., & Siebecker, M. G. (2022). Environmental soil chemistry. Elsevier. 4. Bleam, W. F. (2016). Soil and environmental chemistry. Academic Press. 5. Greenland, D. J. (2015). The chemistry of soil processes (pp. 728-pp). 6. Jones, J. (2018). Soil analysis handbook of reference methods. CRC press. 7. Rayment, G. E., & Lyons, D. J. (2011). Soil chemical methods: Australasia (Vol. 3). CSIRO publishing. 8. Faithfull, N. T. (2002). Methods in agricultural chemical analysis: A practical handbook (pp. xxii+-266).