USK UNIVERSITAS SYIAH KUALA

FACULTY OF AGRICULTURE

DEPARTMENT OF SOIL SCIENCE

UNDERGRADUATE PROGRAM **MODULE HANDBOOK**

Module designation	Geographic Information System (SSOL2033)
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Muhammad Rusdi, S.P., M.P.
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	-
Module objectives/intended learning outcomes	✔ Students demonstrate a solid understanding of the significance, benefits, and core concepts of Geographic Information Systems (GIS), including spatial data communication and management. ✔ Students understand the use and working principles of GIS and are able to apply them appropriately.
Content	This course introduces geospatial information technologies and the analysis of data with geographic, temporal, and spatial contexts, covering the development and management of related tools such as aerial photographs and satellite remote sensing imagery, Global Positioning System (GPS), and computerized Geographic Information Systems (GIS). It addresses the fundamental concepts of spatial data; types and components of spatial data management; georeferencing; data models (vector and raster); and the processes of data acquisition, input, and processing. The course further emphasizes the application of spatial data for natural resource and environmental management, with a particular focus on agriculture and spatial planning.
Exams and assessment formats	Case method, quiz, assignment, mid term exam, final exam

Study and examination requirements	✔ Case method: 50% ✔ Quiz: 10% ✔ Assignment: 10% ✔ Midterm exam: 15% ✔ Exam: 15%
Reading list	1. Rahajo B dan M Ihsan. 2019. Tutorial ArcGIS Desktop, Geosiana Press 2. Prahasta, E. 2019. Konsep-konsep dasar sistem informasi geografis, Penerbit ANDI 3. Kang-Tsung, Chang. 2016. Introduction to Geographic Information Systems. Edisi ke-8. Mc Graw-Hill Education. Singapore 4. Longley, P. A., & Cheshire, J. A. (2017). Geographical information systems. In The Routledge Handbook of Mapping and Cartography (pp. 251-258). Routledge. 5. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). Principles of geographical information systems. Oxford university press. 6. Sahu, N., Reddy, G. P., Kumar, N., & Nagaraju, M. S. S. (2015). High resolution remote sensing, GPS and GIS in soil resource mapping and characterization-A Review. Agricultural Reviews, 36(1), 14-25. 7. Minasny, B., & McBratney, A. B. (2016). Digital soil mapping: A brief history and some lessons. Geoderma, 264, 301-311. 8. LANKI, D. A. (2024). Geographic Information System (GIS) application in soil fertility management: a review. Journal of Global Agriculture and Ecology. 9. Islam, M. A., Hasan, M. A., & Farukh, M. A. (2017). Application of GIS in general soil mapping of Bangladesh. Journal of Geographic Information System, 9(5), 604-621.