UNDERGRADUATE PROGRAM **MODULE HANDBOOK**

Module designation	Remote Sensing (SSOL1016)
Semester(s) in which the module is taught	2nd Semester
Person responsible for the module	Prof. Ir. Sugianto, M.Sc, Ph.D
Language	Indonesian, English
Relation to curriculum	Compulsory module for Soil Science Department
Teaching methods	Lecture, small group discussion, interactive discussion
Workload (incl. contact hours, self-study hours)	✔ 100 minutes lecture and discussion per week ✔ 120 minutes structured tasks per week ✔ 120 minutes learn to be independent per week
Credit points	2 SKS = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	✔ Students can understand the importance, benefits, and concepts of Remote Sensing; be able to explain the principles of electromagnetic waves in Remote Sensing; and able to describe platforms and types of sensors. ✔ Students can understand and explain the concepts of resolution and image object recognition, as well as explain image classification and analysis ✔ Students can explain digital image data input and the basic principles of digital image data processing ✔ Students can explain satellite development for land use applications
Content	This course covers the scope of remote sensing, including its physical foundations and several formulas used in remote sensing, as well as types of photographs, knowledge of photo scale, and parallax measurement. It also includes elements and methods of aerial photo interpretation, as well as the application of aerial photography. Additionally, the course discusses types of satellite imagery, scanning systems, pattern recognition, radiometric and geometric corrections, image enhancement techniques, and the unique characteristics of satellite images (such as Landsat, IKONOS, QuickBird, Radar, etc.). It also introduces interpretation techniques for satellite imagery, particularly for applications in agriculture, with a focus on soil and crop management.
Exams and assessment formats	Essay, Article paper, Assignment, Quiz, Midterm exam, Final exam

Study and examination requirements	✔ Case Method: 50% ✔ Project Based: 25% ✔ Quiz: 5% ✔ Assignment: 5% ✔ Midterm exam: 7,5% ✔ Final exam: 7,5%
Reading list	1. Zhang, L., Zhang, L., & Du, B. (2016). Deep learning for remote sensing data: A technical tutorial on the state of the art. IEEE Geoscience and remote sensing magazine, 4(2), 22-40. 2. Chi, M., Plaza, A., Benediktsson, J. A., Sun, Z., Shen, J., & Zhu, Y. (2016). Big data for remote sensing: Challenges and opportunities. Proceedings of the IEEE, 104(11), 2207-2219. 3. Huang, Y., Tao, Y. U., & HUANG, X. Z. (2018). Agricultural remote sensing big data: Management and applications. Journal of Integrative Agriculture, 17(9), 1915-1931. 4. Liu, P. (2015). A survey of remote-sensing big data. frontiers in Environmental Science, 3, 45. 5. Congalton, R. G., & Green, K. (2019). Assessing the accuracy of remotely sensed data: principles and practices. CRC press. 6. Mather, P., & Tso, B. (2016). Classification methods for remotely sensed data. CRC press