24. Geotechnical Geophysics

Module Name	:	Geotechnical Geophysics
Module Level	:	Bachelor
Code, if applicable	:	23H06131503
Subtitle, if applicable	:	-
Courses, if applicable	:	Geophysics
Semester(s) in which the module is taught	:	V (Fifth Semester)
Module coordinator(s)	:	Prof. Dr. Ir. Muh. Altin Massinai, MT., Surv.
Lecturer(s)	:	• Prof. Dr. Ir. Muh. Altin Massinai, MT., Surv. • Drs. Erfan, M.Si. • Andi Muhammad Pramatadie, S.T., M.Eng., Ph.D
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Elective courses in the third year for Bachelor Degree in Geophysics
Type of teaching, contact hours	:	This course is delivered through Lectures (i.e., Project/Case-based learning), complemented by structured assignments (paper review, project/case evaluation) and independent study. Contact hours consist of 150 minutes lectures per week, plus 180 minutes per week for each of the following: structured assignments and independent study
Workload	:	Total workload is 135 hours per semester, consisting of 38 hours for lectures, and 48.5 hours each for structured assignments and independent study
Credit points	:	3 SKS (4.8 ECTS)
Requirements according to the examination regulations	:	Students are eligible to attend the examination if their absences are less than 20% of the lectures
Recommended prerequisites	:	-
Module objectives/intended learning outcomes	:	After completion of this module, students will be able to: CLO 1. Able to explain the impacts of geological hazards and the role of geophysical methods in geotechnical engineering; CLO 2. Able to apply geophysical methods to solve various problems in geotechnical engineering;

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<tr><td></td><td></td><td>CLO 3. Able to create seismic and landslide hazard zoning maps based on geophysical methods;

The following is the mapping of the ILO and the CLO of this course:

<table>
<tr><td></td><td>ILO 6</td><td>ILO 7</td><td>ILO 13</td></tr>
<tr><td>CLO 1</td><td></td><td>✓</td><td></td></tr>
<tr><td>CLO 2</td><td>✓</td><td></td><td></td></tr>
<tr><td>CLO 3</td><td></td><td></td><td>✓</td></tr>
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<tr><td>Content</td><td>:</td><td>1. Geological Hazards
2. Earthquakes and Their Impacts
3. Landslides
4. Determination of S-Wave Velocity Profile
5. Surface Wave Survey Methods
6. Microtremor Method
7. Soil Amplification
8. Earthquake Microzonation
9. Mapping of Bedrock Depth</td></tr>
<tr><td>Study and examination requirements</td><td></td><td>Participants are marked based on their performance in theory: Project / Case Study (56%), Assignment (24), Written Examination (20%).

Students are marked based on their percentage of points obtained and based on the following grade scale:

<table>
<tr><th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr>
<tr><td>85 – 100</td><td>A</td><td>4.00</td></tr>
<tr><td>80 - <85</td><td>A-</td><td>3.75</td></tr>
<tr><td>75 - < 80</td><td>B+</td><td>3.5</td></tr>
<tr><td>70 - < 75</td><td>B</td><td>3.0</td></tr>
<tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr>
<tr><td>60 - < 65</td><td>C+</td><td>2.5</td></tr>
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		50 - < 60 | C | 2.00 40 - < 50 | D | 1.00 < 40 | E | 0.00
Exams and assessment formats		Assessment in this course consists of a project or case study, assignments, and written examination. The project or case study is conducted in a group or individually and requires students to apply theoretical concepts to analyze and solve a problem, presented in the form of a written report. Assignments are completed individually and may include problem-solving tasks, data processing, or short essays; these are submitted in written form and may involve graphical or computational outputs. The written examination (*closed-book*, written) evaluates students' understanding of fundamental concepts covered CLO 1, CLO 2 and CLO 3.
Reading list	1.	**Main References:** 1. Kramer, S. L., 1996; Geotechnical Earthquake Engineering; Prentice-Hall. 2. Foti, S., Lai, C.G., Rix, G.J., and Strobbia, C., 2015, Surface Wave Methods for Near-Surface Site Characterization: CRC Press 3. Sharma, P. V., 1997, Environmental and Engineering Geophysics: Cambridge University Press. 4. Parnadi, W.W., 2008, Diktat Kuliah Geofisika Teknik dan Lingkungan 5. Oliveira, Roca, Goula (Eds.), 2008, Assessing and Managing Earthquake Risk; Springer. **Additional References:** 1. Recent papers on geophysical applications in geotechnical engineering published in the journals The Leading Edge, Geophysics, Near Surface Geophysics, First Break, Geophysical Prospecting, and Journal of Applied Geophysics.
Last revision date		July 1st, 2025