



Bachelor Program in Geophysics

Faculty of Mathematics and Natural Sciences
HASANUDDIN UNIVERSITY

4. Geomechanics

Module Name	:	Geomechanics
Module Level	:	Bachelor
Code, if applicable	:	23H06110302
Subtitle, if applicable	:	-
Courses, if applicable	:	Geomechanics
Semester(s) in which the module is taught	:	II (Second Semester)
Module coordinator(s)	:	Dr. Eng. Amiruddin, S.Si., M.Si.
Lecturer(s)	:	Dr. Eng. Amiruddin, S.Si., M.Si. and Dr. Muhammad Hamzah S., S.Si.,MT.
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Compulsory course in the first 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 100 minutes lectures per week, plus 120 minutes per week for each of the following: structured assignments and independent study
Workload	:	Total workload is 90 hours per semester, consisting of 28 hours for lectures, and 31 hours each for structured assignments and independent study
Credit points	:	2 SKS (3.2 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	:	Mathematical Geophysics I
Module objectives/intended learning outcomes	:	After completion of this module, students will be able to: CLO 1. Students are able to detail geomechanical variables (quantities and processes) from various geomechanical principles correctly; CLO 2. Students are able to analyze Newtonian mechanics; CLO 3. Students are able to analyze Lagrangian and Hamiltonian mechanics.



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		The following is the mapping of the ILO and the CLO of this course: <table><tr><td></td><td>ILO 4</td><td>ILO 8</td><td>ILO 11</td><td>ILO 13</td></tr><tr><td>CLO 1</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>CLO 2</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>CLO 3</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr></table>		ILO 4	ILO 8	ILO 11	ILO 13	CLO 1	✓				CLO 2		✓	✓	✓	CLO 3		✓	✓	✓										
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CLO 2		✓	✓	✓																												
CLO 3		✓	✓	✓																												
Content	:	1. Coordinate systems and coordinate transformations 2. Review of Newton's laws and their applications 3. Work and energy 4. Euler-Lagrange 5. Newtonian mechanics																														
Study and examination requirements		Participants are marked based on their performance in theory: Project/ Case Study (80%) and 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><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table>	Percentage of Achievement	Grade	Conversion Value	85 – 100	A	4.00	80 - <85	A-	3.75	75 - < 80	B+	3.5	70 - < 75	B	3.0	65 - < 70	B-	2.75	60 - < 65	C+	2.5	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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< 40	E	0.00																														
Exams and assessment formats		Assessment in this course consists of a case study 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																														



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	of a written report. The first written examination (<i>closed-book</i> , written) evaluates students' understanding of fundamental concepts covered in CLO 1 and CLO 2. The second written examination (<i>closed-book</i> , written) assesses comprehension of CLO 3.
Reading list	Main References: 1. Peeter Joot, 2016, Classical Mechanics, Independent Study 2. Takwale, R.G and Puranik, P.S, 1983, Introduction to Classical Mechanics, Tata McGraw-Hill Publising Company Ltd, New Delhi 3. Goldstein, Herbert, 1980, Classical Mechanics, 2nd Ed, Addison-Wesley Publishing Company, Massachusetts 4. Landau L. D., dan Lifshitz, E. M., Mechanics, Pergamon Press, 1960, New York. 5. Modul Geomekanika Departemen Geofisika Additional References: 1. Software Inversi Geofisika, Komputer, LCD
Last revision date	July 1 st , 2025