	INSTITUT TEKNOLOGI SEPULUH NOPEMBER FACULTY OF CIVIL PLANNING AND GEO ENGINEERING GEOPHYSICAL ENGINEERING DEPARTMENT UNDERGRADUATE PROGRAM (S1)	
Course	**Course Name**	**Geotechnical**
	Course Code	**CF234418**
	Credit	**3 (Three)**
	Semester	**4 (Four)**
COURSE DESCRIPTION		
Soil classification, soil physical and mechanical parameters, soil compaction and slope stability calculations using analytical and auxiliary programs, concepts, survey design, data processing results and interpretation of geophysical methods in the case of river dams and embankments, highways, landfills, tunnels and offshore buildings .		
PROGRAM LEARNING OUTCOMES (PLO)		
PLO-5	Able to explain the concepts and principles of geophysical engineering methods that utilize geological, geospatial, instrumentation and information technology data to create or modify models to solve complex geophysical and geophysical engineering problems in depth and procedurally by prioritizing conservation concepts and principles environment, occupational safety and health in the laboratory and field, current principles and issues in legal, economic, environmental, socio-cultural, political, health and safety aspects, sustainable development as well as the development of the latest technology and advanced materials in the field of geophysical engineering.	
PLO-6	Able to apply processes or components of geophysical engineering methods to create or modify models that utilize geological, geospatial, instrumentation and information technology data procedurally starting from identifying, formulating, analyzing and finding the source of the problem, proposing the best solution to solve the problem, designing and operationalizing the process, processing systems and hardware and software equipment required in existing geophysical engineering designs, local and national resources as well as engineering design and analysis tools that are most appropriate, effective and efficient in solving complex geological and geophysical engineering problems in depth by taking into account factors law, economics, environment, socio-cultural, political, health, public safety, culture,and sustainable development.	
COURSE LEARNING OUTCOMES (CLO)		
CLO1	Able to explain the concept of soil mechanics andprinciples of geophysical methods.	
CLO2	Able to implement geotechnical methods procedurally.	
CLO3	Able to implement geophysical methods procedurally starting from data search, processing, subsurface geology and modeling to solve in-depth geotechnical problems.	
SUB COURSE LEARNING OUTCOMES (SUB CLO)		
Sub-CLO1	[C2,A3] Able to classify soil and explain the concept of soil physical and mechanical parameters and soil compaction.	
Sub-CLO2	[C4,P3,A4] Able to calculate slope stability using analytics and auxiliary programs.	
Sub-CLO3	[C4,P3,A4] Able to implement geotechnical methods procedurally.	

Sub-CLO4	[C2,A3] Able to explain the concepts and principles of geophysical methods for the construction and monitoring of embankments, roads, landfills, tunnels and offshore
Sub-CLO5	[C4, P3, A4] Able to implement geophysical methods for the construction and monitoring of embankments, highways, landfills, tunnels and offshore

STUDY MATERIALS

1. Soil Mechanics: soil classification, soil physical and mechanical parameters, soil compaction and slope stability calculations.
2. Application of Geophysical methods in geotechnical problems: Concept, survey design, data processing results and interpretation in the case of river dams and embankments, highways, landfills, tunnels and offshore buildings.

PRECONDITION

Geophysical Data Modeling and Rock Physics

REFERENCES

1. Braja M. Das (2021) Principles of Geotechnical Engineering, Cengage Learning, Stanford, USA.
2. Braja M. Das (2016), Principles of Foundation Engineering, Cengage Learning, Boston, USA.
3. Barker RD, Butcher AP, Culshaw MG, Jackson PD, McCann DM, Skipp BO, Matthews SL, Arthur JCR (2002), Geophysics in engineering investigations, CIRIA, London.
4. Mark E. Everett, (2013), Near-Surface Applied Geophysics, Cambridge Press. London.
5. Ria AAS and Dwa Desa Warnana (2020), Residual Soil Behavior, ITB Press
6. American Society for Testing and Materials (ASTM) Volume 04.08, March 2005, Soil and Rock (I): D 420 - D 5611.
7. 7. American Society for Testing and Materials (ASTM) \Volume 04.09, April 2005, Soil and Rock (II): D 5714 - latest