

Course Type	Course Code	Name of Course	L	T	P	Credit
DP	NCEC542	Numerical Geotechnics-II	0	0	3	1.5

Course Objective

The course aims at numerical simulation of geotechnical applications

Learning Outcomes

Upon successful completion of this course, the students should be able to:

- Learn to solve different application problems numerically

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1.	Seepage analysis through dam and sheet pile through FEM/FDM software	3	Numerical simulation of seepage analysis.
2.	Analysis of stresses in soil mass under applied loading through FEM/FDM software	3	Stress and displacement determination in soil mass under applied loading
3.	Solution of one dimensional consolidation problems and effect on bearing capacity.	3	Numerical simulation of on dimensional consolidation problems.
4.	Stability of slope subjected seepage and rapid drawdown condition.	3	Stability analysis of slopes and factor of safety determination.
5.	Stochastic analysis of slopes and excavations.	3	Introduction to probabilistic analysis
6	Determination of Earth pressure and sstability of rigid retaining wall	3	Stability analysis of rigid retaining wall
7	Stability analysis of flexible retaining wall.	3	Analysing stability of flexible retaining wall.
8	Modeling and analysis of reinforced earth wall.	3	Reinforced earth wall analysis.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
9	Bearing capacity determination of shallow footing on soil.	3	Bearing capacity determination of strip and circular footing on soil.
10	Bearing capacity determination of shallow footing on rock.	3	Bearing capacity determination of strip and circular footing on rock.
11	Pull out capacity of anchors in soil	3	Tensile capacity determination of footing.
12	Tunnel analysis and stress determination.	3	Introduction to tunnel analysis.
13	Analysis of piles in layered clay.	3	Pile capacity determination in clay.
14	Analysis of piles in sand.	3	Pile capacity determination in sand.
	Total Contact Hours	42	

Text Books:

1. Budhu, M. (2010). Soil Mechanics and Foundations, 3rd Edition, Wiley.
2. Optum G2 Manual (2023). Optum Computational Engineering, Copenhagen, Denmark.

Reference Books:

1. Das, B.M. (2013). Advanced Soil Mechanics, 4th Edition, CRC Press.
2. Helwany, S. (2007). Applied Soil Mechanics with ABAQUS Applications, Wiley Publications.