

GOVERNMENT POLYTECHNIC, JAIPUR
DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Subject: Geotechnical Engineering (CEPC-207)

Semester: III

Session: Winter 2026

Duration: 01.07.2026 – 05.11.2026

Faculty: Sushree Souravi Rout

Week	Class No.	Topic to be Covered
1	1	Introduction to Geotechnical Engineering, scope, objectives and applications
1	2	Origin of soil, weathering of rocks and soil formation
1	3	Soil profile and different types of soil
2	4	Three-phase system of soil
2	5	Mass-volume relationship of soil
2	6	Numerical problems on mass-volume relationship
3	7	Index properties of soil and engineering significance
3	8	Grain size distribution of soil
3	9	Sieve analysis – procedure and calculations
4	10	Hydrometer analysis – principle, procedure and applications
4	11	Soil consistency and Atterberg limits
4	12	Determination of Liquid Limit, Plastic Limit and Shrinkage Limit
5	13	Plasticity Index, Liquidity Index and Consistency Index
5	14	Indian Standard Soil Classification System (ISCS)
5	15	Engineering properties of different soil groups
6	16	Soil compaction – concept and objectives
6	17	Factors affecting compaction
6	18	Standard Proctor Compaction Test
7	19	Modified Proctor Compaction Test
7	20	Moisture-Density Relationship Curve
7	21	Field compaction methods and quality control
8	22	Permeability of soil and Darcy's Law
8	23	Coefficient of permeability
8	24	Laboratory determination of permeability
9	25	Factors affecting permeability

9	26	Seepage of water through soil
9	27	Effective stress principle
10	28	Total stress, pore water pressure and effective stress
10	29	Capillary rise and seepage pressure
10	30	Numerical problems on effective stress
11	31	Consolidation of soil and settlement
11	32	Terzaghi's one-dimensional consolidation theory
11	33	Factors affecting consolidation
12	34	Shear strength of soil
12	35	Mohr-Coulomb failure theory
12	36	Laboratory determination of shear strength
13	37	Direct Shear Test
13	38	Triaxial Compression Test
13	39	Unconfined Compression Test and Vane Shear Test
14	40	Earth pressure – Active, Passive and At-rest
14	41	Rankine's Earth Pressure Theory
14	42	Bearing capacity of soil – terminology and factors
15	43	Terzaghi's Bearing Capacity Theory
15	44	Soil stabilization methods and applications
15	45	Revision, important numericals and previous-year questions