

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN



LESSON PLAN

SUBJECT: GEOTECHNICAL ENGINEERING (TH 2)

FACULTY: SRI KSHITISH KUMAR SAHOO

ACCADEMIC SESSION: 2024-25

SEMESTER: 3RD

SEC: B

HOD / Sr. Lecturer (Civil Engg.)

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| Discipline: Civil Engineering | Semester/ Section: 3 RD / B | | Name of the teaching faculty: SRI KSHITISH KUMAR SAHOO |
| Subject: Th2.Geotechnical Engineering | No. of Days/ per week class allotted: 04 period per week. (Tue, Wed, Fri) | | Semester From Date: 01-07-2024 To Date: 08-11-2024 No. of weeks: 18 |
| Week | Class Day | No of period available | Topics to be covered |
| 1ST | 02.07.2024 | 1 | 1 Introduction: 1.1 Soil and Soil Engineering |
| | 03.07.2024 | 2 | 1.2 Scope of Soil Mechanics, 1.3 Origin and formation of soil |
| | 05.07.2024 | 1 | 2 Preliminary Definitions and Relationship: 2.1 Soil as a three Phase system. |
| 2ND | 09.07.2024 | 1 | 2.2 Water Content, Density, Specific gravity, Voids ratio, Porosity, Percentage of air voids, air content. |
| | 10.07.2024 | 2 | 2.2 degree of saturation, density Index, Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameters. |
| | 12.07.2024 | 1 | Problems on chapter 2. |
| 3RD | 16.07.2024 | 1 | Problems on chapter 2. |
| | 19.07.2024 | 1 | 3 Index Properties of Soil: 3.1 Water Content |
| 4TH | 23.07.2024 | 1 | 3.2 Specific Gravity |
| | 24.07.2024 | 2 | 3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses. |
| | 26.07.2024 | 1 | 3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index. |
| 5TH | 30.07.2024 | 1 | 3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index |
| | 31.07.2024 | 2 | Problems on chapter 3 |
| | 02.08.2024 | 1 | Problems on chapter 3 |
| 6TH | 06.08.2024 | 1 | 4 Classification of Soil: 4.1 General |
| | 07.08.2024 | 2 | 4.2 I.S. Classification, Plasticity chart |
| | 09.08.2024 | 1 | 5 Permeability and Seepage: 5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability. |
| 7TH | 13.08.2024 | 1 | 5.4 Seepage pressure, effective stress, phenomenon of quick sand |
| | 14.08.2024 | 2 | 5.4 Seepage pressure, effective stress, phenomenon of quick sand |

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| | 16.08.2024 | 1 | Problems on chapter 5 |
| 8TH | 20.08.2024 | 1 | Problems on chapter 5 |
| | 21.08.2024 | 2 | 6 Compaction and Consolidation:6.1 Compaction: Compaction, Light and heavy compaction Test |
| | 23.08.2024 | 1 | 6.1 Optimum Moisture Content of Soil, Maximum dry density, Zero air void line. |
| | 27.08.2024 | 1 | 6.1 Factors affecting Compaction, Field compaction methods and their suitability and problems. |
| 9TH | 28.08.2024 | 2 | 6.2 Consolidation: Consolidation, distinction between compaction and consolidation. |
| | 30.08.2024 | 1 | 6.2 Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications. |
| | 03.09.2024 | 1 | Class test 1 |
| 10TH | 04.09.2024 | 2 | Problems on chapter 6. |
| | 06.09.2024 | 1 | 7 Shear Strength: 7.1 Concept of shear strength, Mohr- Coulomb failure theory |
| | 10.09.2024 | 1 | 7.1 Cohesion, Angle of internal friction, strength envelope for different type of soil. |
| 11TH | 11.09.2024 | 2 | 7.1 Measurement of shear strength; - Direct shear test. |
| | 13.09.2024 | 1 | IA |
| | 17.09.2024 | 1 | 7.1 triaxial shear test, unconfined compression test and vane-shear test. |
| 12TH | 18.09.2024 | 2 | 8 Earth Pressure on Retaining Structures: 8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest. |
| | 20.09.2024 | 1 | 8.2 Use of Rankine's formula for the following cases (cohesion-less soil only) |
| | 24.09.2024 | 1 | 8.2 (i) Backfill with no surcharge. |
| 13TH | 25.09.2024 | 2 | 8.2 (ii) backfill with uniform surcharge. |
| | 27.09.2024 | 1 | Problems on chapter 8 |
| | 01.10.2024 | 1 | Problems on chapter 8 |
| 14TH | 04.10.2024 | 1 | Problems on chapter 8 |
| | 15.10.2024 | 1 | Problems on chapter 8 |
| 15TH | 18.10.2024 | 1 | Class test 2 |
| | 22.10.2024 | 1 | 9 Foundation Engineering: 9.1 Functions of foundations, shallow and deep |

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| | | | foundation. |
| | 23.10.2024 | 2 | 9.1 different type of shallow and deep foundations with sketches. |
| | 25.10.2024 | 1 | 9.1 Types of failure (General shear, Local shear & punching shear) |
| 17TH | 29.10.2024 | 1 | 9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings, Effect water table on bearing capacity of soil. |
| | 30.10.2024 | 2 | 9.3 Plate load test and standard penetration test. |
| | 01.11.2024 | 1 | Doubt clarification |
| 18TH | 05.11.2024 | 1 | Previous year questions discussion. |
| | 06.11.2024 | 2 | Previous year questions discussion. |
| | 08.11.2024 | 1 | Previous year questions discussion. |