**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK**

**DEPARTMENT OF CIVIL ENGINEERING**

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**LESSON PLAN**

| SUBJECT: GEOTECHNICAL ENGINEERING (TH 2) | ACCADEMIC SESSION: 2021-22 |
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| FACULTY: SRI KSHITISH KUMAR SAHOO | SEMESTER: 3 RD |
|  | SEC: A |

| Sd/- |
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| H O D (Civil Engg.) |

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| **Discipline:**  **Civil Engineering** | **Semester/ Section:**  **3RD/ A** | | **Name of the teaching faculty:**  **SRI KSHITISH KUMAR SAHOO** |
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| **Subject:**  Th2.**Geotechnical Engineering** | **No. of Days/ per week class allotted: 04 period per week. (Tue, Thu, Fri, Sat)** | | **Semester From Date: 01-10-2021 To Date: 08-01-2022**  **No. of weeks: 14** |
| **Week** | **Date** | **No of period available** | **Topics to be covered** |
| 1ST | 01/10/2021 | 1 | 1.1 Soil and Soil Engineering  1.2 Scope of Soil Mechanics  1.3 Origin and formation of soil |
| 2ND | 05/10/2021 | 1 | 2.1 Soil as a three Phase system. |
| 07/10/2021 | 1 | 2.2 Water Content, Density, Specific gravity, |
| 08/10/2021 | 1 | 2.2 Voids ratio, Porosity, Percentage of air voids, air content, degree of saturation, |
| 09/10/2021 | 1 | 2.2 density Index, Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameters |
| 3RD | 21/10/2021 | 1 | Problem solving of 2nd chapter |
| 22/10/2021 | 1 | Problem solving of 2nd chapter |
| 23/10/2021 | 1 | 3.1 Water Content  3.2 Specific Gravity |
| 4TH | 26/10/2021 | 1 | 3.3 Particle size distribution: Sieve analysis, |
| 28/10/2021 | 1 | 3.3 wet mechanical analysis, particle size distribution curve and its uses |
| 29/10/2021 | 1 | 3.4 Consistency of Soils, Atterberg’s Limits |
| 30/10/2021 | 1 | 3.4 Plasticity Index, Consistency Index , Liquidity Index, Indices |
| 5TH | 02/11/2021 | 1 | Problems solving on chapter 3 |
| 05/11/2021 | 1 | 4.1 General  4.2 I.S. Classification, Plasticity chart |
| 06/11/2021 | 1 | Problems solving on chapter 4 |
| 6TH | 09/11/2021 | 1 | Exam on Chapter 1, 2,3,4 |
| 11/11/2021 | 1 | 5.1 Introduction to chapter 5  5.1 Concept of Permeability |
| 12/11/2021 | 1 | 5.1  Darcy’s Law, Co-efficient of Permeability  5.2 Factors affecting Permeability |
| 13/11/2021 | 1 | 5.3 Constant head permeability and falling head permeability Test |
| 7TH | 16/11/2021 | 1 | 5.4 Seepage pressure , effective stress, phenomenon of quick sand |
| 18/11/2021 | 1 | Problems solving on chapter 5 |
| 20/11/2021 | 1 | **6.1 Compaction:** Compaction, Light and heavy compaction Test |
| 8TH | 23/11/2021 | 1 | 6.1 Optimum Moisture Content of Soil, Maximum dry density, Zero air void line |
| 25/11/2021 | 1 | 6.1  Factors affecting Compaction |
| 26/11/2021 | 1 | 6.1  Field compaction methods and their suitability |
| 27/11/2021 | 1 | **6.2 Consolidation:** Consolidation |
| 9TH | 30/11/2021 | 1 | 6.2 distinction between compaction and consolidation. |
| 02/12/2021 | 1 | 6.2 Terzaghi‘s model analogy of compression/ springs showing the process of consolidation – field implications |
| 03/12/2021 | 1 | 6.2 Terzaghi‘s model analogy of compression/ springs showing the process of consolidation – field implications |
| 04/12/2021 | 1 | Problems solving on chapter 6 |
| 10TH | 07/12/2021 | 1 | 7.1 Concept of shear strength |
| 09/12/2021 | 1 | 7.1 Mohr- Coulomb failure theory, Cohesion, Angle of internal friction. |
| 10/12/2021 | 1 | 7.1 strength envelope for different type of soil. |
| 11/12/2021 | 1 | 7.1 Measurement of shear strength- Direct shear test, triaxial shear test. |
| 11TH | 14/12/2021 | 1 | 7.1 unconfined compression test and vane-shear test. |
| 16/12/2021 | 1 | Problems on chapter 7 |
| 17/12/2021 | 1 | Exam on chapter 6 & 7 |
| 18/12/2021 | 1 | 8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest. |
| 12TH | 21/12/2021 | 1 | 8.2 Use of Rankine’s formula for the following cases (cohesion-less soil only)  (i) Backfill with no surcharge |
| 23/12/2021 | 1 | 8.2 Use of Rankine’s formula for the following cases (cohesion-less soil only)  (ii) backfill with uniform surcharge |
| 24/12/2021 | 1 | Problems on chapter 8 |
| 13TH | 28/12/2021 | 1 | 9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. |
| 30/12/2021 | 1 | 9.1 Types of failure (General shear, Local shear & punching shear) |
| 31/12/2021 | 1 | 9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi’s formulae & IS Code formulae for strip, Circular and square footings. |
| 14TH | 04/01/2022 | 1 | 9.2 Effect water table on bearing capacity of soil.  9.3 Plate load test and standard penetration test. |
| 06/01/2022 | 1 | Problems on Chapter 9 |
| 07/01/2022 | 1 | REVISSION |
| 08/01/2022 | 1 | REVISSION |