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| LESSON PLAN OF 4TH SEMESTER(2016-19) CIVIL ENGINEERING | | |
| Discipline :-CIVIL | Semester:-4TH | Name of the Teaching Faculty  MADHUSMITA SAHOO |
| Subject:-  Geotechnical engg. | No of Days/per Week Class Allotted :-05 | Semester From:- **02ND JAN,2019** To:- **15TH APRIL, 2019**  No of Weeks:- **14** |
| **Week** | **Class Day** | **Theory/ Practical Topics** |
| 1st | 1st | 1.0 INTRODUCTION  1.1- Soil and Soil Engineering.  1.2- Scope of Soil Mechanics |
| 2nd | 2.0 PRELIMINARY DEFINITIONS AND RELATIONSHIP.  2.1- Soil as a three Phase system. |
| 3rd | Weight volume relationships: Water Content ,Density |
| 4th | Specific gravity,Voids ratio, Porosity, |
| 2nd | 1st | degree of saturation ,Percentage of air voids, air content, |
| 2nd | density Index, Bulk/Saturated/dry/submerged density. |
| 3rd | 3.0DETERMINATION OF INDEX PROPERTIES.  3.1- Water Content (Pycnometer method, Oven drying method) |
| 4th | 3.2- Specific Gravity |
| 3rd | 1st | 3.3- Particle size distribution, Sieve analysis, Wet mechanical analysis- Pipette method, Basic concept of Hydrometer Analysis |
| 2nd | 3.4 – Consistency of Soils, Atterberg’s Limits, Plasticity Index, Consistency Index, Liquidity Index |
| 3rd | 4.0CLASSIFICATION OF SOIL.  4.1- General. |
| 4th | 4.2- Particle size Distribution. |
| 4th | 1st | -Textural Classification. |
| 2nd | -HRB Classification. |
| 3rd | -Unified Soil Classifications |
| 4th | I.S. Classification. |
| 5th | 1st | 5.0PERMEABILITY AND SEEPAGE  5.1- Concept of Permeability, Darcy’s Law |
| 2nd | Co-efficient of Permeability, |
| 3rd | 5.2 Factors affecting Permeability |
|  | 4th | 5.3- Constant head permeability and |
| 6th | 1st | falling head permeability Test |
| 2nd | 5.4- Seepage pressure, the phenomenon of quick sand |
| 3rd | 5.5- Concept of flow-net, Properties and application of flow-net. |
| 4th | 6.0- COMPACTION AND CONSOLIDATION.  6.1- Compaction, Light and heavy compaction Test |
| 7th | 1st | **Optimum Moisture Content of Soil, Maximum dry density, Zero air void line** |
| 2nd | Factors affecting Compaction |
| 3rd | Field compaction methods and their suitability |
| 4th | Consolidation, distinction between compaction and consolidation |
| 8th | 1st | **Spring Analogy method, Pressure-void ratio curve, normally consolidated** |
| 2nd | under consolidated and over consolidated soil, Assumption of Terzaghi’s theory of one-dimensional consolidation, Laboratory Consolidation Test |
| 3rd | Co-efficient of Consolidation, Time Factor, Estimation of consolidation settlement, Difference between primary and secondary consolidation |
| 4th | 7.0SHEAR STRENGTH.  7.1- Concept of shear strength |
| 9th | 1st | Mohr- Coulomb failure theory, |
| 2nd | Cohesion, Angle of internal friction |
| 3rd | strength envelope for different type of soil, |
| 4th | Measurement of shear strength;- Direct shear test, |
| 10th | 1st | triaxial shear test, unconfined compression test and vane-shear test |
| 2nd | 8.0EARTH PRESSURE ON RETAINING STRUCTURES |
| 3rd | 8.1Active earth pressure |
| 4th | Passive earth pressure, |
| 11th | 1st | Earth pressure at rest. |
| 2nd | 8.2- Use of Rankine’s formula for the following cases (cohesion-less soil only) |
| 3rd | (i) Backfill with no surcharge, |
| 4th | (ii) backfill with uniform surcharge. |
| 12th | 1st | iii) submergedbackfill |
| 2nd | 9.0 FOUNDATION ENGINEERING. 9.1- Functions of foundations, |
| 3rd | shallow and deep foundation, |
| 4th | different type of shallow and deep foundations with sketches. |
| 13th | 1st | Types of failure (General shear, Local shear & punching shear) |
| 2nd | 9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi’s formulae & IS Code formulae for strip, Circular and square footings |
| 3rd | 9.3 Machine Foundation: Introduction to Soil dynamics, Terms associated with soil dynamics |
| 4th | Free vibration and Forced vibration, Natural frequency, Types of |
| 14th | 1st | machines and machine foundation, General requirements, Design of machine |
| 2nd | foundations: Reciprocating type , Centrifugal type, Impact type, |
| 3rd | Isolation of foundations. |
| 4th | PREVIOUS YEAR QUESTION DISCUSSION |