SOIL MECHANICS/GEOTECHNICAL ENGINEERING I

PROF. DILIP KUMAR BAIDYA

Department of Civil Engineering
IIT Kharagpur

PRE-REQUISITES : Engineering Mechanics

INTENDED AUDIENCE : Civil Engineering

INDUSTRY SUPPORT : Most of the Civil Engineering companies

COURSE OUTLINE :

Broadly Geotechnical Engineering encompasses two distinct segments: Soil Mechanics and Foundation Engineering. Soil Mechanics deals with study of physical properties of soils, and the relevance of these properties as they affect soil strength, stability, and drainage. Foundation engineering deals with (i) selection of foundation type based on building site conditions and site constraints, (ii) determining size and reinforcement of the foundation and (iii) finally construction of foundation element. This course will focus on the first, soil mechanics. Soil Mechanics is the basis for all geotechnical applications.. One has to learn basic principle of geotechnical engineering through soil mechanics and it is a core course for civil engineering in every college/university across the globe. Every aspect of soil mechanics starting from origin of soil to stability of soil slopes will be covered with great detail under this course.

ABOUT INSTRUCTOR :

Prof. Dilip Kumar Baidya is presently a Professor in Civil Engineering at IIT Kharagpur, graduated in Civil Engineering in 1987 from Bengal Engineering College Sibpur and obtained ME and Ph D from IISc Bangalore in the year 1989 and 93, respectively. Have 25 years of experience in teaching and research and guided more than 25 M Tech dissertations and 7 Ph D theses on Geotechnical Engineering. Published more than 100 papers in National/international journals and conferences out of which 3 papers received best paper award. Visited different countries for presenting papers in the international conferences and served 2 years as Faculty members in the University of West Indies, Trinidad and Tobago.Besides teaching and research, provided consultancy services to various industrial problems. Held several administrative positions at IIT Kharagpur which includes responsible position like Vice Chairman/Chairman JEE for IIT Kharagpur zone, Prof In-charge Examination etc.Fellow of Indian Geotechnical Society and member of International Society for Soil Mechanics and Geotechnical Engineering, Elected member of Executive committee of IGS for 2017-18.

COURSE PLAN :

Week 1: Origin of soil and its Classification

Week 2: Three-phase diagram & Weight volume relationship

Week 3: Soil Compaction, seepage and permeability

Week 4: Effective stress concept and applications

Week 5: Bouusinesq's theory and vertical stress distribution

Week 6: Shear Strength I

Week 7: Shear strength II

Week 8: Compressibility of soils

Week 9: Consolidation and time rate of settlement

Week 10: Earth pressure theory I

Week 11: Earth pressure theory II

Week 12: Introduction to Stability of slopes