



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

FOUNDATION ENGINEERING								
VII Semester: CE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACEC35	Core	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45		Tutorial Classes: Nil		Practical Classes: Nil		Total Classes: 45		
Prerequisite: Geotechnical Engineering								
I. COURSE OVERVIEW:								
<p>Civil Engineers are required to construct structures on the soil. The loads coming onto these structures, along with the self-weight, have to be safely transmitted to the soil beneath it. A geotechnical engineer must be able to design a footing in such a way that soil below it will not fail there will not be any excessive settlements in the soil. This course enables students to design a shallow and deep foundation, analyze the stability of slopes, and check the stability of retaining walls and embankments against failure. Through this course content engineers can design the foundation for safety and serviceability.</p>								
II. COURSE OBJECTIVES:								
The students will try to learn:								
<p>I. The methods of soil exploration, field tests on soil by planning and soil investigation report documentation.</p> <p>II. The stability of infinite and finite slopes using different parameters.</p> <p>III. The various earth pressure theories and stability of retaining walls.</p> <p>IV. The theoretical, field tests and bearing capacity of shallow, deep and well foundations.</p>								
III. COURSE SYLLABUS:								
MODULE –I: SOIL EXPLORATION (9)								
<p>Need and methods of soil exploration, boring and sampling methods, pits and trenches, drifts and shafts, methods of boring, auger borings, wash borings, rotary drilling, percussion drilling, core drilling, types of soil samples, disturbed samples, undisturbed samples, design features affecting the sample disturbance, split spoon samplers, scraper bucket samplers, shell by tubes and thin walled samplers, piston samplers, preservation and handling of samples. Instrumentation in soil engineering, strain gauges, resistance and inductance type plate load test, pressure meter, geo physical methods, planning and preparation of soil investigation report.</p>								
MODULE –II: SLOPE STABILITY (9)								
<p>Infinite and finite earth slopes, types of failures, factor of safety of infinite slopes, stability analysis by Swedish arc method, standard method of slices, Bishop's Simplified method, Taylor's Stability number, and stability of slopes of earth dams under different conditions.</p>								
MODULE –III: EARTH PRESSURE THEORIES AND RETAINING WALLS (9)								
<p>Rankine's theory of earth pressure, earth pressures in layered soils, Coulomb's earth pressure theory, Culmann's graphical method.</p> <p>Types of retaining walls, stability of retaining walls against overturning, sliding and bearing capacity.</p>								
MODULE –IV: SHALLOW AND DEEP FOUNDATIONS (9)								
<p>Types, choice of foundation, location of depth, safe bearing capacity, Terzaghi, Meyerhof, Skempton and IS Methods. Safe bearing pressure based on N value, allowable bearing pressure, plate load test, allowable settlements of structures, Analysis of foundation, individual, strip, combined footings and mat foundations</p>								

conventional. Types of piles, load carrying capacity of piles based on static and dynamic formulae, pile load tests, load carrying capacity of pile groups in sands and clays, settlement of pile groups. Introduction to foundations on expansive soils and marine foundations.

MODULE –V: WELL FOUNDATIONS (9)

Different shapes of wells, components of well, sinking of well, tilts and shifts, principles of analysis and design, IRC guidelines.

IV.TEXT BOOKS:

1. Braja M. Das, “Principles of geotechnical engineering” Cengage learning publishers, 2002.
2. V.N.S Murthy, Geotechnical Engineering: Principles and practices of soils mechanics and foundation engineering”, Taylor & Francis Group, 2002.
3. Gopal Ranjan and ASR Rao, “Basic and Applied Soil Mechanics”, New age international Pvt. Ltd, New Delhi, 2000.

V.REFERENCE BOOKS:

1. C. Venkataramiah, “Geotechnical engineering”, New Age International Pvt. Ltd,2002.
2. Manojdutta and Gulati, “Geotechnical engineering”, Tata McGrawhill publishers New Delhi,2005.
3. K.R .Arora, “Soil mechanics and foundation engineering”, standard publishers and distributors, New Delhi,2005

VI.WEB REFERENCES:

1. <http://nptel.ac.in/courses/105107120/1#>
2. <https://ocw.mit.edu/courses/civil,environmental,engineering/1,364,advanced,geotechnical,engineering,fall,2003/index.html>

VII. E-TEXT BOOKS:

https://books.google.co.in/books?hl=en&lr=&id=_MzWBetcVhAC&oi=fnd&pg=PR11&dq=applied+geotechnics&ots=PugqOAphwC&sig=2zr9mAAy9nPcyHaKgmtFpcC1M&redir_esc=y#v=onepage&q=applied%20geotechnics&f=false