

M.E.(Civil) (Infrastructure Engineering) Semester: I

Subject Name: Foundation engineering

Subject code : MECV104

A. Learning objectives:

The objective of this course is

- To understand the soil behaviors before and after application of loads.
- To be able to design various foundations.
- To be aware of various reinforced techniques to enhance Soil Bearing Capacity of poor soils

B. Teaching Scheme (Credits and Hours)

Teaching Scheme				Credit Scheme			Evaluation Scheme				
Lect Hrs	Tu Hrs	Prac. Hrs	Total	Theory	Pra/TW	Total	UE	IE	CIA	Prac/Viva	Total
04	02	00	06	04	01	05	70	30	20	30	150

C. Detailed Syllabus

Unit No.

Topics

- 1 Site investigations-** spacing/depth of boreholes, disturbed/undisturbed soil sampling, geophysical exploration, electrical resistivity method, preparation of borhole logs and final report.
- 2 Shallow foundations-** theories of bearing capacity, standard penetration test, design of a footing in cohesionless/cohesive soil based on settlement and bearing capacity criteria, plate load test, combined footings, eccentrically loaded footings. Analysis and design of raft based on settlement and bearing capacity criteria.
- 3 Deep Foundation & Retaining walls** - various types, size proportioning and stability analysis. Pile foundations- driven piles in cohesive/cohesion less soil, bearing capacity/settlement aspects, analysis and design of pile groups, bored cast-in-situ piles, pile driving equipment. Ground improvement- sand drains and surcharging

D. Lesson Planning:

Unit No	Topics	Hours	Weightage
1	Site investigations	10	25%
2	Shallow foundations	18	35%
3	Deep Foundation & Retaining walls	28	40%

E. List of Tutorials:

Sr. No.	Tutorial Content
1	Problem solving on “Site investigations”.
2	Problem solving on “Shallow foundations”
3	Assignment on “Deep Foundation & Retaining walls”.

E. Instructional Method and Pedagogy (Continuous Internal Assessment (CIA) Scheme)

- At the start of course, the course delivery pattern, prerequisite of the subject will be Discussed
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc
- Attendance is compulsory in lectures and laboratory which carries 10 Marks weightage
- One internal exam will be conducted.
- Assignment/Surprise tests/Quizzes/Seminar will be conducted which carries 5 Marks as a part of internal theory evaluation
- The course includes a assignments, where students have an opportunity to build an appreciation for the concepts being taught in lectures

F. Students Learning Outcomes:

On successfully completion of term

- Students will learn planning and execution of soil exploration techniques.

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- Student will able to work out field soil bearing capacity with appropriate methods and tools
- Students will know the various I.S. code criteria for SPT test and results.

G. Recommended Study Material:

❖ **Text Books:**

1. Arora, K.R., Soil Mechanics & Foundation Engineering, Standard Publication, New Delhi.
2. Punamia, B.C., Soil Mechanics & Foundation Engineering, Laxmi Publication Pvt. Ltd., New Delhi.
3. Murthy, V.N.S., Soil Mechanics & Foundation Engineering; Sai Kripa Technical Consultants, Bangalore.
4. Shroff A. V., Shah D. L., “Soil Mechanics & Geotechnical Engineering”, Oxford-IBH New Delhi.

Reference Books:

1. Singh Alam, Soil Engineering, Vol. – I and II, Asia Publication House.
2. Fang and Einterkorn, Foundation Engineering Handbook.
3. Peck, Thomson and Thornburn, Foundation Engineering,
4. Shamsheer Prakash and Gopal Ranjan, Analysis and Design of Retaining Structures, Sarita Publications.
5. Sribivasula and Vaidyanathan, Handbook of Machine Foundation, Tata McGraw Hill Book Co., New Delhi.

Web Materials:

1. <http://edudel.nic.in>
2. <http://bis.org.in/other/quake.htm>
3. http://www.vastu-design.com/india_homes.htm
4. <http://www.thepeninsulaneighborhood.com/ThePlan.html>
5. http://www.historytution.com/indus_valley_civilization/town_planning.html