

PECI 5412 **ADVANCED FOUNDATION ENGINEERING** (3-0-0)

Module – I

Foundation subjected to Vibration: Introduction, definitions, degrees of freedom, types of machine foundation, single degree of freedom system, free and forced vibration with and without damping. Parameters influencing the design of machine foundations. IS code of practice for the design of various types of machine foundations.

Measurement of dynamic soil parameters: Field and Laboratory tests (low strain and large strain tests, element and model tests)

Module – II

Sheet pile walls: Cantilever and anchored sheet pile walls, methods of analysis, Vertical cuts and ditches, earth pressure analysis.

Coffer dams: Types, description.

Floating foundation: Introduction, types, methods to prevent floatation, necessity of using raft for full floating foundation.

Module – III

Foundations on expansive soil: Shrinkage and expansion of clays, identification of expansive soil, swelling pressure measurement, causes and type of damages in building on expansive clays, structural and environmental solutions, Principles of design of foundation in expansive soil deposits.

Reference Books :

1. Soil Mechanics and Foundations by B. C. Punmia et al., Laxmi Publications (P) Ltd, New Delhi.
2. Foundation Engineering, P.C. Verghese, Prentice Hall of India
3. Textbook of Geotechnical Engineering, I. Q. Khan, Prentice Hall
4. Geotechnical Earthquake Engineering by *Steven L. Kramer*, Low Price Edition, Pearson Education, www.pearsoned.co.in
5. Soil Dynamics by *Shamsher Prakash*, McGraw-Hill Book Company
6. Geotechnical Engineering by Donald P. Cudoto, Pearson Education, Prentice Hall