

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE5032W - Design of Bridge Foundation

Credit Distribution: C:9 L:3 T:0 P:0 E:0 O:6 TH:0

Course Type: Theory

Description: To provide students with understanding of:

- (1) Requirements of foundation design of bridges, and
- (2) Design and Detailing of different types of bridge foundations.

Course Content: Introduction Definitions; Modes of failure; Requirements; Choice of foundation Foundation Design Shallow foundations in soil, intermediate geomaterials and rocks; Pile foundations in soil, intermediate geomaterials and rocks; Piles in liquefiable soil; Lateral capacity of piles and pile groups; concrete filled steel tubular piles; load capacity and design; end bearing of piles in soft soils (other than rock); pile cap design Well foundations - load capacity and design, tilt and shift of well and their impact on design Abutments; Retaining walls - reinforced earthwalls Code provisions; Special requirements in earthquake resistant design Settlement of Foundation Systems Short-term and Long-term; Earthquake Deformations Construction Issues of Foundations Foundation construction practices; Dewatering; Drivability of piles; integrity test of piles; grouting at shaft and at base of piles Integrated Structural Analysis Foundation-structure interaction; Beam on elastic foundation approach; P-y curves of piles Load Testing Procedures

Text Books

- None

Reference Books

- Bowels,J.E. (2001). "Foundation Analysis and Design", 5th Edition, McGraw-Hill International.
- Coduto,D.P., Kitch,W.A., and Yeung,M.R., (2016), Foundation Design - Principles and Practices, 3rd Edition, Pearson Education International
- Ranjan,G., and Rao,A.S.R., (2016), Basic and Applied Soil Mechanics, 3rd Edition, New Age International
- Tomlinson,M.J., and Woodward,J., (2014), Pile Foundation and Construction Practice, 6th Edition, SPON Press
- Varghese,P.C., (2005), Foundation Engineering, Prentice-Hall India

Prerequisite: NIL