

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE6110 – Advanced Concrete Technology

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

Course Type: Theory

Description: To develop a strong understanding of the materials science and chemistry of constituent materials of concrete, with a view of analyzing the behaviour of concrete in the short and long term

Course Content: Part 1: Concrete materials Cement “ Production, composition, hydration chemistry Aggregates “ Geology of concrete aggregates Chemical and mineral admixtures for concrete High performance concrete mixture proportioning Part 2: Concrete behaviour Advanced topics in fresh concrete “ Rheology, pumping of concrete Advanced topics in hardened concrete “ Behaviour under various loads, creep and shrinkage Durability problems of concrete.

Text Books: No prescribed text.

Reference Books

- Neville, A. M., “Properties of Concrete,” Pitman Publishing, Inc., MA, 1981.
- Mehta, P. K., and Monteiro, P. J. M., “Concrete: Structure, Properties, and Materials,” Second Edition, Prentice Hall, Inc., NJ, 1993.
- Hewlett, P. C., Ed., “Lea’s Chemistry of Cement and Concrete,” Fourth Edition, Arnold Publishers, NY, 1998.
- Bentur, A., Diamond, S., and Berke, N.S., “Steel Corrosion in Concrete,” E&FN Spon, UK, 1997.
- Taylor, H. W. F., “Cement Chemistry,” Academic Press, Inc., San Diego, CA, 1990.
- Lea, F. M., “The Chemistry of Cement and Concrete,” Chemical Publishing Company, Inc., New York, 1971.
- Mindess, S., and Young, J. F., “Concrete,” Prentice Hall, Inc., NJ, 1981.
- J. Newman and B. S. Choo, Eds., “Advanced Concrete Technology,” Four Volume Set, Elsevier, 2003.

Prerequisite: NIL