



# ADVANCED CONCRETE TECHNOLOGY

## **PROF. MANU SANTHANAM**

Department of Civil Engineering  
IIT Madras

**INTENDED AUDIENCE** : Post-graduate students, and final year undergraduate students

**PRE-REQUISITES** : Basic course on Construction Materials in UG level. Additional course on Concrete Technology (UG level) is optional.

**INDUSTRIES APPLICABLE TO** : Civil contracting firms, Ready mixed concrete companies, Cement companies, Construction chemicals companies, Materials research laboratories etc

## **COURSE OUTLINE :**

This course explores the materials science of concrete, and attempts to bring about the understanding of concrete behavior from a fundamental perspective. The first part of the course discusses the structure and properties of concrete making materials. This is followed by mixture proportioning of high performance concrete, and a study of selected topics regarding fresh and hardened concrete behavior. The final part of the course deals with long term performance issues, related to creep, shrinkage and durability of concrete.

## **ABOUT INSTRUCTOR :**

Prof. Manu Santhanam is a Professor in the Department of Civil Engineering at IIT Madras, where he has worked since October 2001. His primary research interests are in Cement Chemistry, Durability of Concrete and Non-Destructive Evaluation. He has published more than 75 refereed journal papers, and has guided 10 PhD theses, in addition to being lead investigator on several sponsored projects.

## **COURSE PLAN :**

**Week 01** : Cement production and composition

**Week 02** : Cement chemistry

**Week 03** : Aggregates for concrete

**Week 04** : Chemical admixtures

**Week 05** : Chemical and Mineral admixtures

**Week 06** : Mineral admixtures

**Week 07** : High performance concrete mixture proportioning

**Week 08** : Topics in fresh concrete

**Week 09** : Topics in hardened concrete

**Week 10** : Creep and shrinkage

**Week 11** : Durability of concrete

**Week 12** : Durability of concrete