CHARACTERIZATION OF CONSTRUCTION MATERIALS

PROF. MANU SANTHANAM  
Department of Civil Engineering  
IIT Madras  

TYPE OF COURSE : New | Elective | PG  
COURSE DURATION : 12 weeks (27 Jan’ 20 - 17 Apr’ 20)  
EXAM DATE : 26 Apr 2020

PROF. PIYUSH CHAUNSALI  
Department of Civil Engineering  
IIT Madras

PRE-REQUISITES : Basic Civil Engineering degree  
INTENDED AUDIENCE : Interested Learners  
INDUSTRIES APPLICABLE TO : Cement companies, Concrete Producers, Construction chemical manufacturers, Construction companies

COURSE OUTLINE :  
The objective of the course is to introduce students to the characterization of construction materials and their behaviour, with a view of developing their understanding of the mechanisms that govern the performance of these materials. The course will be focused primarily on cement and concrete, and include a few techniques; the physics of the techniques and their application to cement science. Lab demonstrations and experiments will be covered.

ABOUT INSTRUCTOR :  
Dr. Manu Santhanam is a Professor at the Department of Civil Engineering at IIT Madras. His research interests are in multi-scale characterization of concrete, supplementary cementing materials, durability and non-destructive evaluation  
Dr. Piyush Chaunsali is an Assistant Professor at the Department of Civil Engineering at IIT Madras. His research focuses on the use of principles of materials science, life-cycle assessment and structural engineering to design sustainable building materials

COURSE PLAN :  
Week 1: Introduction to course; Structure of Construction Materials – An Overview  
Week 2: Calorimetry  
Week 3: X-ray diffraction  
Week 4: X-ray diffraction, cont’d  
Week 5: Thermal analysis  
Week 6: Surface area measurement  
Week 7: Optical microscopy  
Week 8: Scanning electron microscopy  
Week 9: Image analysis  
Week 10: Spectroscopic techniques  
Week 11: Mercury intrusion porosimetry  
Week 12: Impedance analysis and ultrasonic methods