

JSS MAHAVIDYAPEETHA

JSS SCIENCE AND TECHNOLOGY UNIVERSITY, MYSURU

'COURSE WORK FOR M.Sc., (Engg.,) and Ph.D Programmes 2017-18

Course Code: **PCT 001**

Course Title: **ENDURING CONSTRUCTION MATERIALS**

Construction materials: Concrete- Hydration-microstructure -pore solution composition-control of rheology and density in fresh concrete- concrete microstructure- deformations and crack control.

Aggregates: Introduction, Historical back ground of Light weight aggregate concrete, Artificial aggregates, Physical properties of aggregates, Light weight aggregate concrete, Applications of light weight aggregate concrete, Properties of green light weight aggregate concrete, Effect of size aggregate on the strength properties of LWAC made with palm oil shells, Recycled aggregate, Pre placed aggregate concrete.

Mineral admixtures: Fly Ash, Ground Granulated Blast Furnance Slag, Silica Fumes, Rice Husk Ash, Metakaolin.

Masonry: Types of bonds, brick mortar characteristics, reinforced and unreinforced masonay,behaviour of masonry under different loads.

Durability tests: Chemical attack, effect of sea water on concrete,Chloride penetration, compressive strength, Split tensile, Flexural strength, Fatigue, schmidt rebound hammer, ultrasonic pulse velocity, probe penetration, pullout test, breakoff test, pull out test, test combinations,permeability to liquidis and/or gases,water absorption and sorptivity, porosity: pore spacing parameters, mechanical parameters-abrasion resistance chemcial parameters-calcium hydroxide content-degree of hydration physiochemical and electro checmcal parameters-diffusivity and conductivity- resistivity-electrical migration-rapid chloride penetration test.

Corrosion in Concrete: Corrosion in concrete and its protection, Corrosion of rebars in concrete, Influence of fly ash on the corrosion steel bar in concrete.

Advanced Materials: Adhesives in construction industry-Acrylics,Industrial waste materials in concrete Rapid wall panels, Moisture Barriers.

REFERENCE BOOKS:

1. Adam M Neville, Properties of Concrete, 5th Edition, Longman Sc and Tech Publishers, 2011
2. Kumar Mehta. P and Paulo J M Monteiro, Concrete Microstructure, Properties and Materials, McGraw Hill, 2006.
3. Mark Alexander,Arnon Bentur and Sidney Mindess,Durability of Concrete,CRC Press.
4. Benoit Bissonnette,Luc Courard, and Andrzej Garbacz, Concrete Surface Engineering, CRC Press,2017.
5. K S Jagadeesh, B V Venkataramana Reddy and K S Nanjunda Rao , Alternative Building Materials and Technologies, New age international,2018.