

Course Name:

Advanced Concrete Technology

Course Number: 20-212	Credit: 3
Program: Graduate	Course Type: Technical Selective
Prerequisite: -	Corequisite: -

Course Description (Objectives):

This course is designed to study the characteristics and properties of concrete at the microstructural level. It aims to help students understand concrete behavior, enhance its properties, and achieve the desired performance from concrete.

Course Content (outline):

- Chapter 1: Mix design and investigation of compressive and tensile behavior of high-strength concrete
- Chapter 2: Effect of strength on the volumetric expansion of concrete under uniaxial pressure
- Chapter 3: The role of high-strength concrete in tall structures
- Chapter 4: Mechanical properties and applications of fiberreinforced concrete
- Chapter 5: Influence of concrete strength on mechanical properties including compression, tension, and bending of steel fiber-reinforced concrete
- Chapter 6: Comparison of mechanical properties of lightweight fiber-reinforced and non-fiber concrete
- Chapter 7: Properties of steel fiber-reinforced concrete under impact loading
- Chapter 8: Investigation of shrinkage cracks in polypropylene fiberreinforced concrete
- Chapter 9: Study of mortar behavior reinforced with palm leaf fibers
- Chapter 10: Theoretical study and comparison of ring and fiber behavior in concrete structures
- Chapter 11: Behavior and applications of fiber-reinforced concrete
- Chapter 12: Concrete containing elastic powder
- Chapter 13: Investigation of some parameters affecting the behavior of sulfur concrete
- Chapter 14: Investigation of the properties of crushed brick



aggregates and their use in concrete

- Chapter 15: Investigation of the properties of crushed ceramic aggregates and their use in concrete
- Chapter 16: Investigation of the properties of clinker brick aggregates and their use in concrete
- Chapter 17: Clinker brick concrete
- Chapter 18: Rice husk concrete, polystyrene concrete, and lightweight concrete
- Chapter 19: Relationship between strength and weight of lightweight concrete made with LECA
- Chapter 20: Achieving high-strength lightweight concrete
- Chapter 21: Design and construction of RCC dams and comparison with earth dams
- Chapter 22: Optimal mix design of Roller Compacted Concrete (RCC)
- Chapter 23: Parameters affecting the behavior of plastic concrete
- Chapter 24: Structural role of micro-silica concrete
- Chapter 25: Role of micro-silica in enhancing concrete durability
- Chapter 26: Role of admixtures in increasing the service life of concrete structures
- Chapter 27: Production and management of sand and gravel production
- Chapter 28: Investigation of deterioration factors of reinforced concrete structures in the Persian Gulf
- Chapter 29: Properties and applications of ordinary and special cements
- Chapter 30: Methods for quality control of concrete
- Chapter 31: Methods for repairing concrete structures

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