## Republic of Iraq

Ministry of Higher Education and Scientific Research Supervision and Scientific Evaluation Apparatus



College: Shatt Al-Arab University
Department: Civil Engineering

Stage: 2<sup>nd</sup> stage

Lecturer name: Dr. Jawad K. Mures

**Academic title: Lecturer** 

## **Course Weekly Outline**

E-mail address   jawadmures@gmail.com	Name	Dr. Jawad K. Mures					
This Module aims at helping students:  1. To develop an understanding about the fundamentals of concrete technology.  2. To be aware of concrete historical development, general characteristics, types, and factors influencing Concrete properties.  3. To discuss and understand the materials involved in making Concrete.  4. Studying the concrete at its Fresh Stage including its design, estimation of material proportions as well as manufacturing, delivery, placing and curing.  5. Study the concrete at it Hardened stage including understanding concepts such as Shrinkage and Creep as well as Durability of concrete.  6. To understand the various laboratory tests required to be done for the concrete at various stages of its development.  By the end of this module, students should be able to exhibit the following key learning outcomes of this module:  1. Recall key historical stages of concrete development over the centuries.  Discuss and list concrete types, characteristics and factors influencing its properties.  2. Define and list the various types of cementitious binders. Explain the process of manufacturing Portland cement and its chemical composition.  3. Explain the hydration process of Portland cement and define Portland cement types.  4. Explain the effect of aggregate on concrete and classify the various types of aggregates. Discuss and explain the properties of aggregate moisture contitions of aggregate moisture content, fineness modules and Bulk specific gravity. Discuss the characteristics of water used in concrete.  6. Define the workability of fresh concrete and explain its method of measurement, segregation, bleeding and list the factors affecting workability of concrete.  7. Explain and carry out the relevant calculations for concrete mix design using both the American and British methods.  8. Discuss the Handened Concrete Dimensional Stability—Shrinkage and Creep, Durability as well as non-destructive tests.  1. Advanced concrete technology by Zongjin Li. 2. Concrete technology by Dr. Modid Nory  Final	E-mail address	jawadmures@gmail.com					
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## **Course Weekly Outline**

Concrete Definition and Historical Development, Concrete as a Structural Material, Characteristics of Concrete Types of Concrete and Factors Influencing Concrete Properties.  Cementitious Binders: Classification of binders, Portland cement, Manufacture of Portland cement, Chemical composition, Hydration of Portland cement, The Geopolymers  Aggregates: Effects of aggregates, Classification of aggregates: Effects of aggregates, Classification of aggregates: Froperties of aggregates, Moisture conditions, Moisture content (MC) calculations, Density and specific gravity, Unit weight, Measurement of moisture content, Grading aggregates, Shape and texture of aggregates. Solved examples for Moistures content (MC) calculations.  Admixtures: Definition and classifications, Chemical admixtures, Air-entraining admixtures, Mineral admixtures, air-entraining admixtures, Mineral admixtures, air-entraining admixtures, Mineral admixtures, air-entraining and washing.  Morkability of fresh concrete Piam (Pack)  Bolved Examples for American method for concrete Mix Design using the American Institute of Concrete method  Solved Examples for American method for concrete Mix design.  Concrete Properties of Concrete Mix design.  Concrete Properties of Concrete Mix design.  Concrete Properties of Concrete Mix design.  Manufacture of Concrete Delivery of Concrete. Concrete Properties of Concrete in forms, Compacting and finishing, Coursing, Early-Age Properties of Concrete Concrete Placing: Site preparation, conveying concrete, Concrete Properties of Concrete Mix Coursing, Early-Age Properties of Concrete Concrete Placing: Site properties of Concrete Concrete Concrete Concrete	Week No.	Theoretical	Experimental	Aims
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