

Concrete Technology Catalogue 2023-2024

College	Erbil Technology College	
Department	Construction & Materials Technology Engineering	
Module Name	Concrete Technology	
Module Code	COT243	
Semester	4	
Credit	6	
Module type	Theory & Experimental	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	() hr Workload
Weekly hours (Tutorial)	(2)hr Class	() hr Workload
Lecturer (Theory)	Yassin Ali Ibrahim	
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Course Book

<p>Course Description</p>	<p>Consider the article of Concrete Technology is one of the main important items for second stage in Building and Construction department which is one of the near sciences in engineering closely to daily life's where we needed to:</p> <p>1- To remove the arguments between persons and companies or countries with divergence between them.</p> <p>2- Job example with suitable scales which is exist in natures like: (Residential facilities, governmental building, services, for central testing organization , industrials, roads, bridges, sewerage, channels, dischargers, irrigations, rivers...etc.) these examples are useful to developing this areas by input it the services and building up.</p>			
<p>Course objectives</p>	<p>Learning, practical testing, exercise the students to do the corollary computations to get the types and properties of fresh concrete and solution of problems in computing the amount of materials needed for one cubic meter of concrete and their prices to get the cost of one meter cubic of concrete then tests and properties of hardened concrete and designing the mixing proportion of material by different methods, also some information about various types of special concretes.</p>			
<p>Student's obligation</p>	<p>Student must take theoretical exams and practical exam according to institute exam policies. During this, students have to take daily exam (quizzes), homework and weekly reports on the tests, which are done at the previous lecture with assignments. These exams, quizzes, and reports also assignments are account for students' overall marks</p>			
<p>Required Learning Materials</p>	<p>Students can use anything outside the course regardless what kind of source they use. They can use a books, online sources like books, YouTube videos, social media related to the topic...etc</p>			
<p>Evaluation</p>	<p>Task</p>	<p>Weight (Marks)</p>	<p>Due Week</p>	<p>Relevant Learning Outcome</p>
<p>Paper Review</p>				
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Assignments</p>				
<p>Homework</p>		<p><u>2</u></p>	<p><u>2</u></p>	
<p>Class Activity</p>		<p><u>2</u></p>		
<p>Report</p>		<p><u>1</u></p>	<p><u>4</u></p>	
<p>Seminar</p>		<p><u>1</u></p>		
<p>Essay</p>		<p><u>1</u></p>		
<p>Project</p>		<p><u>1</u></p>	<p><u>8</u></p>	
<p>Quiz</p>		<p>1</p>	<p>4</p>	
<p>Lab.</p>		<p>10</p>	<p>1</p>	

	Midterm Exam	25		
	Final Exam	40		
	Total			
Specific learning outcome:	After reading this guide, you will understand the best way to set clear, actionable learning outcomes, and how to write them to improve instruction and training within your organization.			
Course References:	<ul style="list-style-type: none"> . Concrete Technology by A.M. Neville & J.J.Brooks 2004. • DESIGN AND CONTROL OF CONCRETE MIXTURES 1995 o By Steven H. Kosmalka ,William C. Panarese, Kathleen D.Gissing And Norman F. Ma • Concrete Technology, Theory and Practice: by S. CHAND & COMPANY LTD. Multicolour Illustrative Edition (An ISO 9001 : 2000 Company) Ram Nagar, New Delhi - 110 055 • Advanced Concrete Technology< Testing and Quality:’ • Edited by John Newman Department of Civil Engineering Imperial College London 			
Course topics (Theory)	Week	Learning Outcome		
1. Materials for Concrete	1	The principal ingredients that make up the concrete mix are: cement, fine aggregate, coarse aggregate, water, chemical admixtures, and mineral admixtures. Concrete used in construction may also contain reinforcing bars, welded wire fabric (wire mesh), and various reinforcing fibers		
2.Compacting Factor Test	2	Compaction factor test is the workability test for concrete conducted in laboratory. The compaction factor is the ratio of weights of partially compacted to fully compacted concrete. It was developed by Road Research Laboratory in United Kingdom and is used to determine the workability of concrete.		
3. workability lecture	3	The lubrication required for handling concrete without segregation, for placing without loss of homogeneity, for compacting with the amount of efforts forth- coming and to finish it sufficiently easily, the presence of a certain quantity of water is of vital importance.		
4. Consistency, Segregation and	4	Bleeding is a form of segregation in which water present in the concrete mix is pushed upwards		

Bleeding Of Fresh Concrete		due to the settlement of cement and aggregate. The specific gravity of water is low, due to this water tends to move upwards. Bleeding ordinarily occurs in the wet mix of concrete
5. Shrinkage and Creep of Fresh Concrete	5	Creep and shrinkage of concrete are two physical properties of concrete. ... Unlike the creep of metals, it occurs at all stress levels and, within the service stress range, is linearly dependent on the stress if the pore water content is constant.
6. Mixing Of Concrete ,Transporting And Placing Concrete	6	Creep and shrinkage of concrete are two physical properties of concrete. ... Unlike the creep of metals, it occurs at all stress levels and, within the service stress range, is linearly dependent on the stress if the pore water content is constant
7. Compaction of Concrete	7	Compaction is the process which expels entrapped air from freshly placed concrete and packs the aggregate particles together so as to increase the density of concrete. It increases significantly the ultimate strength of concrete and enhances the bond with reinforcement.
8. Effects of Vibration on concrete mixtures	8	The higher the vibrator speed, the more “cream” comes to the surface creating bleed channels. The higher the vibrator speed and the lower the concrete's viscosity at the surface of the pavement, the more surface inconsistencies are created.
9. curing of concrete	9	Curing of Concrete is a method by which the concrete is protected against loss of moisture required for hydration and kept within the recommended temperature range. ... A curing practice involves keeping the concrete damp or moist until the hydration of concrete is complete and strength is attained.
10. hardened concrete	10	Hardened concrete is a type of concrete that is strong and have the capacity to bear the structural as well as service loads that are applied to it. Hardened concrete is one of the strongest and durable construction materials. Hardened concrete is concrete that is completely set and able to take the loads.
11. Pumping of Concrete	11	Concrete pumping is the transporting of a freshly mixed batch of concrete to a specific location on a site. ... There are two common types of concrete pump: ground pumps (or line pumps) and boom pumps.
12. Factors affecting on the Properties of Hardened Concrete	12	Weather conditions: The atmospheric variation also affects the properties of hardened concrete. The high temperature results in expansion cracks and reduced ... 2 votes: Factors affecting properties of hardened concrete

Practical Topics	Week	Learning Outcome
1. Slump Test	1	The concrete slump test measures the consistency of fresh concrete before it sets. It is performed to check the workability of freshly made concrete
2. Flow Test	2	The flow table test or flow test is a method to determine consistency of fresh concrete. Flow table test is also used to identify transportable moisture limit of solid bulk cargoes It is used primarily for assessing concrete that is too fluid (workable) to be measured using the slump test, because the concrete will not retain its shape when the cone is removed.
3. Compaction Test	3	Compaction factor test is the workability test for concrete conducted in laboratory. The compaction factor is the ratio of weights of partially compacted to fully compacted concrete. It was developed by Road Research Laboratory in United Kingdom and is used to determine the workability of concrete.
4. Vee-bee Time Test	4	The time required for complete remoulding in seconds is considered as a measure of workability and is expressed as the number of Vee- Bee seconds.
5. Kelly Ball Test	5	Workability of concrete is a complex property of concrete . Finding the workability of concrete requires a huge amount of data and involves lengthy calculations. Many researchers have tried with different parameters to measure the workability of the concrete and later found some of the tests which are very close to check the workability.
6. Effect of water cement ratio on concrete compressive strength	6	A lower ratio leads to higher strength and durability, but may make the mix difficult to work with and form. Work-ability can be resolved with the use of plasticizers or super-plasticizers.
7. Effect of mix ratio on compressive strength of concrete	7	Concrete is among the most important building materials in civil engineering. While concrete in construction contributes to socio-economic growth in both developed and developing countries, it is clear that some of its operations produce several negative changes to the natural environment. The high cost of cement in Nigeria, the negative environmental effects of its production, the high energy demand, the rapid depletion of natural raw materials for the production of Portland cement, all lead to reducing the attractiveness of Portland cement

8. Effect of curing condition on compressive strength of concrete	8	If the potential of concrete with regards to strength and durability is to be fully realized, it is most essential that it be cured adequately. The curing becomes even more important if the concrete contains supplementary cementing materials such as fly ash or ground, granulated blast-furnace slag or silica fume, and is subjected to hot and dry environments immediately after casting.
9. Concrete Mix Design Calculation for M20, M25, M30 Concrete	9	Mix Design of Concrete Procedure. The following steps to be followed for concrete mix design calculation ,. Step-1 Determining the Target Strength of Concrete .
10. Determination Of Flexural Strength Of Concrete	10	Flexural test evaluates the tensile strength of concrete indirectly. It tests the ability of unreinforced concrete beam or slab to withstand failure in bending. The results of flexural test on concrete expressed as a modulus of rupture which denotes as (<i>MR</i>) in MPa or psi.
11. Non Destructive Testing Of Concrete	11	Our NDT Services Are Performed On All Types Of Tubing In Heat Exchangers & Condensers. We're The #1 Condenser Performance Company In The World. Give Us A Call For More Info. Professional services. Worldwide locations. Innovative technology.
12. Determine the Pulse Velocity, Crack Depth and Compressive Strength of concrete by using PUNDIT – lab ultrasonic instrument	12	Crack on concrete should not be ignored because it is one of the main causes of collapse. Therefore, preliminary investigation of concrete structure is needed. Crack examination in term of the crack width is not enough to evaluate the damage of concrete building. It is also necessary to measure the crack depth of concrete.

Extra notes:

External Evaluator

Reviewed by: