**Course Description Form**

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| 1. Course Name: | | | | | | | | |
| **Reinforced Concrete Design I** | | | | | | | | |
| 1. Course Code: | | | | | | | | |
|  | | | | | | | | |
| 1. Semester / Year: | | | | | | | | |
| First semester / third year | | | | | | | | |
| 1. Description Preparation Date: | | | | | | | | |
| 29-3-2024 | | | | | | | | |
| 1. Available Attendance Forms: | | | | | | | | |
| class | | | | | | | | |
| 1. Number of Credit Hours (Total) / Number of Units (Total) | | | | | | | | |
| 4 hours / 3 unit | | | | | | | | |
| 1. Course administrator's name (mention all, if more than one name) | | | | | | | | |
| Name: Bashar Abdelkarim  Email: bashar.faisal@muc.edu.iq | | | | | | | | |
| 1. Course Objectives | | | | | | | | |
| **Course Objectives** | | | | **Gaining scientific knowledge in:**  **1. Properties of concrete and steel reinforcement.**  **2. Design of reinforced concrete beams to resist bending, (working stress method).**  **3. Design of reinforced concrete beams to resist bending, (ultimate strength method).**  **4. Design of reinforced concrete beams to resist shear.**  **5. Design of reinforced concrete beams to resist torsion.** | | | | |
| 1. Teaching and Learning Strategies | | | | | | | | |
| **Strategy** | | Present and discuss real-life cases  Presenting and discussing exceptional cases  Raising mathematical problems and dilemmas, discussing them, solving them in more than one way, and comparing different methods  Establish discussion groups  Asking students to submit scientific reports on topics of their choice | | | | | | |
| 1. Course Structure | | | | | | | | |
| **Week** | **Hours** | | **Required Learning Outcomes** | | **Unit or subject name** | | **Learning method** | **Evaluation method** |
| **1** | **4** | | Understand the physical and mechanical properties of concrete and steel reinforcement. | | Properties of concrete and steel reinforcement | | **Lectures** | Tests, quizzes and reports |
| **2** | **4** | | Properties of concrete and steel reinforcement | | **Lectures** | Tests, quizzes and reports |
| **3** | **4** | | Analyze and design reinforced concrete beams to resist bending using the working stress method. | | Design of reinforced concrete beams to resist bending, (working stress method). | | **Lectures** | Tests, quizzes and reports |
| **4** | **4** | | Design of reinforced concrete beams to resist bending, (working stress method). | | **Lectures** | Tests, quizzes and reports |
| **5** | **4** | | Design of reinforced concrete beams to resist bending, (working stress method). | | **Lectures** | Tests, quizzes and reports |
| **6** | **4** | | Apply the ultimate strength method to design reinforced concrete beams for bending. | | Design of reinforced concrete beams to resist bending, (ultimate strength method). | | **Lectures** | Tests, quizzes and reports |
| **7** | **4** | | Perform analysis and design of singly reinforced rectangular sections. | | Analysis of singly rectangular section. | | **Lectures** | Tests, quizzes and reports |
| **8** | **4** | | Design of singly rectangular section. | | **Lectures** | Tests, quizzes and reports |
| **9** | **4** | | Analyze and design doubly reinforced rectangular sections for structural stability. | | Analysis of doubly rectangular section. | | **Lectures** | Tests, quizzes and reports |
| **10** | **4** | | Design of doubly rectangular section. | | **Lectures** | Tests, quizzes and reports |
| **11** | **4** | | Evaluate and design T-sections for bending and other forces. | | Analysis and design of T section. | | **Lectures** | Tests, quizzes and reports |
| **12** | **4** | | Design reinforced concrete beams to resist shear forces effectively. | | Design of reinforced concrete beams to resist shear | | **Lectures** | Tests, quizzes and reports |
| **13** | **4** | | Design of reinforced concrete beams to resist shear | | **Lectures** | Tests, quizzes and reports |
| **14** | **4** | | Develop design solutions for reinforced concrete beams subjected to torsional forces. | | Design of reinforced concrete beams to resist torsion | | **Lectures** | Tests, quizzes and reports |
| **15** | **4** | | Design of reinforced concrete beams to resist torsion | | **Lectures** | Tests, quizzes and reports |
| 1. Course Evaluation | | | | | | | | |
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | | | | | | | | |
| Quizzes and reports 10%  Monthly tests 40%  Final exam. 50% | | | | | | | | |
| 1. Learning and Teaching Resources | | | | | | | | |
| Required textbooks (curricular books, if any) | | | | | | Design of Concrete Structures, Fifteen Edition, by Nilson, Darwin, and Dolan | | |
| Main references (sources) | | | | | | ACI Committee 318 (2014). Building code requirements for structural concrete, (ACI 318M-14) and commentary (318R-19). American Concrete Institute, Farmington Hills, Michigan, USA | | |
| Recommended books and references (scientific journals, reports...) | | | | | | Design of Reinforced Concrete, Ninth Edition, by JACK C. McCORMAK , and RUSSELL H. BROWN  Reinforced Concrete Design, Eighth Edition, by Abi O. Aghayere, and George F. Limbrunner.  Design of Reinforced Concrete Structures, Second Edition, by M. A. Ghoneim, and M. T. El –Mihilmy | | |
| Electronic References, Websites | | | | | |  | | |