

**Ministry of Higher Education and Scientific Research**

**Scientific Supervision and Scientific Evaluation Apparatus**

**Directorate of Quality Assurance and Academic Accreditation**

**Accreditation Department**

**Academic Program and Course Description Guide Academic Program and Course Description Guide**

**Academic Program and Course Description Guide**

**2024**

**Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

**Concepts and terminology:**

**Academic Program Description**: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description**: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

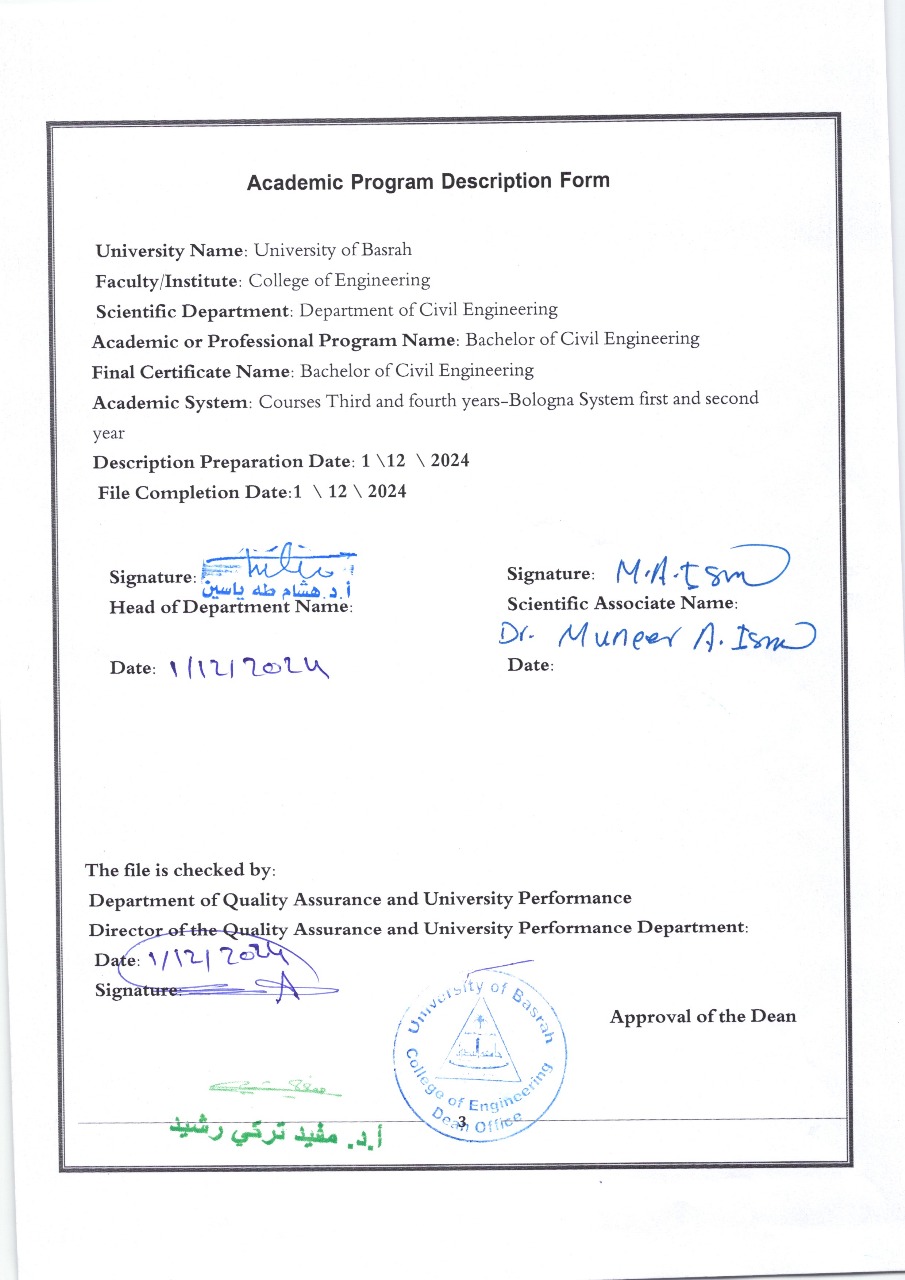
**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students’ teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

**Academic Program Description Form**

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| 1. **Program Vision** |
| The program aims to be one component of these corporations have interest in engineering education in Iraq throughout a distinct program which has known on both the local and international levels. This department provides an educational engineering environment high in quality along with researchers and services that enrich the profession, raise up the community, and provide civil engineers with high efficiency to build and serve their country.  The program mainly plans to continuously upgrade and develop the level of scientific curricula, academic training, and engineering services to suit the department's nobility and honorable history. |

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| 1. **Program Mission** |
| The program aims to fulfill the Iraqi community requirements and all the regions of civil engineers by providing high-quality programs in education and scientific research. It aims also to serve the community by providing the best educational opportunities to graduate distinct students capable to follow up on the last scientific developments according to extensive quality standards. It also takes on his responsibility to students support to increase their abilities and enhance their field and technical skills to enable them to enter the work market and make success in it, in addition, to continuing their education and development in their chosen professions, as well as providing an educational creative environment leads the department staff to more and better productivity. |

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| 1. **Program Objectives** |
| The Civil Engineering program is dedicated to preparing and qualifying specialized engineers who can meet the demands of both the public and private labor markets. This is achieved through diversified teaching and learning methods, practical training, and the application of acquired knowledge and skills to solve real-world problems. The program provides distinguished academic curricula, both theoretical and practical, aligned with international standards of academic quality. It promotes scientific research in civil engineering fields, fosters a supportive environment for faculty development in education and research, and strengthens partnerships with governmental institutions, private sectors, and society to contribute to sustainable development |

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| 1. **Program Accreditation** |
| None |

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| 1. **Other external influences** |
| None |

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| 1. **Program Structure** | | | | |
| **Program Structure** | **Number of Courses** | **Credit hours** | **Percentage** | **Reviews\*** |
| **Institution Requirements** | **5** | **10** | **5%** | **Basic** |
| **College Requirements** | **8** | **39** | **19.7%** | **Basic** |
| **Department Requirements** | **46** | **149** | **75.3%** | **Basic** |
| **Summer Training** | **1** |  |  | **Basic** |
| **Other** |  |  |  |  |

\* This can include notes whether the course is basic or optional.

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| 1. **Program Description** | | | | |
| **Year/Level** | **Course Code** | **Course Name** | **Credit Hours** | |
|  |  |  | **theoretical** | **practical** |
| **First/ 1st semester** | **E122-1** | **Mathematics I** | **4** |  |
| **First/ 1st semester** | **CE114** | **Engineering Geology** | **4** | **2** |
| **First/ 1st semester** | **E126** | **Human rights and democracy** | **4** |  |
| **First/ 1st semester** | **E115** | **Chemistry** | **2** |  |
| **First/ 1st semester** | **CE124** | **Building Material** | **3** | **3** |
| **First/ 1st semester** | **CE131-1** | **Engineering Mechanics-I** | **6** |  |
| **First/ 1st semester** | **U111** | **English I** | **2** |  |
| **First/ 2nd semester** | **CE131-2** | **Engineering Mechanics** | **6** |  |
| **First/ 2nd semester** | **E116** | **Engineering** **workshop** |  | **2** |
| **First/ 2nd semester** | **E122-2** | **Mathematics I** | **4** |  |
| **First/ 2nd semester** | **E128** | **Physics** | **2** | **1** |
| **First/ 2nd semester** | **E125** | **Engineering drawings** | **8** |  |
| **First/ 2nd semester** | **E125** | **Computer software** | **2** | **2** |
| **First/ 2nd semester** | **U121** | **Arabic language I** | **2** |  |
| **Second/1st Semester** | **E212-1** | **Applied Mathematics** | **6** | **-** |
| **Second/1st Semester** | **CE213-1** | **Mechanics of Materials I** | **4** | **-** |
| **Second/1st Semester** | **CE214-1** | **Fluid Mechanics I** | **3** | **2** |
| **Second/1st Semester** | **CE215-1** | **Engineering Surveying I** | **3** | **2** |
| **Second/1st Semester** | **CE228** | **Building Construction** | **2** | **-** |
| **Second/1st Semester** | **CE217** | **Computer Programming** | **2** | **2** |
| **Second/1st Semester** | **U211** | **Arabic language II** | **2** | **-** |
| **Second/2nd Semester** | **CE213-2** | **Mechanics of Materials II** | **4** | **-** |
| **Second/2nd Semester** | **CE214-2** | **Fluid Mechanics II** | **3** | **2** |
| **Second/2nd Semester** | **CE215-1** | **Engineering Surveying II** | **3** | **2** |
| **Second/2nd Semester** | **CE216** | **Concrete Technology** | **3** | **4** |
| **Second/2nd Semester** | **CE227** | **Engineering Statistics** | **2** | **-** |
| **Second/2nd Semester** | **U211** | **Al Baath Crimes** | **2** | **-** |
| **Second/2nd Semester** | **U213** | **English II** | **2** |  |
| **Third/1st Semester** | **CE311-1** | **Engineering Analysis** | **2** | **-** |
| **Third/1st Semester** | **CE312-1** | **Theory of Structures I** | **3** | **-** |
| **Third/1st Semester** | **CE313-1** | **Soil Mechanics I** | **2** | **2** |
| **Third/1st Semester** | **CE314-1** | **Reinforced Concrete Design I** | **3** | **-** |
| **Third/1st Semester** | **CE315-1** | **Irrigation** | **2** | **-** |
| **Third/1st Semester** | **CE316-1** | **Engineering Management** | **2** | **-** |
| **Third/1st Semester** | **CE317-1** | **Traffic Engineering** | **2** | **1** |
| **Third/1st Semester** | **CE318-2** | **Computer Applications I** | **-** | **2** |
| **Third/2nd Semester** | **CE311-2** | **Numerical Analysis** | **2** | **2** |
| **Third/2nd Semester** | **CE312-2** | **Theory of Structures II** | **3** | **-** |
| **Third/2nd Semester** | **CE313-2** | **Soil Mechanics II** | **2** | **2** |
| **Third/2nd Semester** | **CE314-1** | **Reinforced Concrete Design II** | **3** | **-** |
| **Third/2nd Semester** | **CE315-2** | **Drainage** | **2** | **-** |
| **Third/2nd Semester** | **CE316-2** | **Engineering Economy** | **2** | **-** |
| **Third/2nd Semester** | **CE317-2** | **Transportation Engineering** | **2** | **-** |
| **Third/2nd Semester** | **CE318-2** | **Computer Applications II** | **-** | **2** |
| **Forth/ 1st Semester** | **CE411** | **Prestressed Concrete** | **2** | **-** |
| **Forth/ 1st Semester** | **CE412-1** | **Foundation Engineering I** | **3** | **-** |
| **Forth/ 1st Semester** | **CE413-1** | **Steel Structures Design I** | **2** | **-** |
| **Forth/ 1st Semester** | **CE414** | **Hydraulic Structures** | **3** | **-** |
| **Forth/ 1st Semester** | **CE415-1** | **Highway Engineering** | **2** | **1** |
| **Forth/ 1st Semester** | **CE416-1** | **Water Supply Engineering** | **2** | **1** |
| **Forth/ 1st Semester** | **CE417-1** | **Construction Methods** | **2** | **-** |
| **Forth/ 1st Semester** | **CE420-2** | **Engineering Project I** | **-** | **4** |
| **Forth/ 2nd Semester** | **CE412-2** | **Foundation Engineering II** | **3** | **-** |
| **Forth/ 2nd Semester** | **CE413-2** | **Steel Structures Design II** | **2** | **-** |
| **Forth/ 2nd Semester** | **CE418** | **Engineering Hydrology** | **2** | **-** |
| **Forth/ 2nd Semester** | **CE415-1** | **Highway Pavement Analysis & Design** | **2** | **2** |
| **Forth/ 2nd Semester** | **CE416-2** | **Sanitary Sewage Engineering** | **2** | **2** |
| **Forth/ 2nd Semester** | **CE417-2** | **Estimation and Specifications** | **2** | **-** |
| **Forth/ 2nd Semester** | **CE419** | **Engineering Ethics** | **2** | **-** |
| **Forth/ 2nd Semester** | **CE420-2** | **Engineering project II** | **-** | **4** |

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| 1. **Expected learning outcomes of the program** | |
| **Knowledge** | |
| Knowledge and  understanding | 1.Studying of the Cartesian coordinates and basics of analytic geometry.  2. Learning group of methods to drawing functions by different manners.  3. Using concept of limits and approximations to illustrate and understanding mathematic differential concepts.  4.Using concept of limit to justify calculus and differentiation |
| **Skills** | |
| Subject-specific  Skills | 1. An ability to supervise or carry out various civil engineering works.  2. An ability to think and solve problems that arise during the implementation of the work.  3. An ability to write scientific reports and read engineering drawings.  4. An ability to keep pace with developments in engineering materials and methods of implementation |
| Thinking Skills | 1.Attention: Attracting students' attention through questions during the lecture.  2. Response: Follow up the student's interaction with the material displayed on the screen.  3. Attention: Follow up the interest of the student who interacted the most with the presented material.  4. Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  5. Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| **Ethics** | |
|  | 1.Develop the student's ability to deal with technical means.  2. Develop the student's ability to deal with the Internet.  3. Develop the student's ability to deal with multiple means.  4. Develop the student's ability to dialogue and discussion. |

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| 1. **Teaching and Learning Strategies** |
| 1. Explanation and clarification through lectures.  2. Displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures.  4. Laboratories.  5. Graduation projects.  6. Scientific visits.  7. Seminars held in the department.  8. Summer training. |

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| 1. **Evaluation methods** |
| 1. Short exams (quizzes).  2. Homework.  3. Quarterly and final exams for theoretical and practical subjects.  4. Small projects within the lesson.  5. Interacting within the lecture.  6. Reports |

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| 1. **Faculty** | | | | | | |
| **Faculty Members** | | | | | | |
| **Academic Rank** | **Specialization** | | **Special Requirements/Skills (if applicable)** | | **Number of the teaching staff** | |
| **General** | **Special** |  | | **Staff** | **Lecturer** |
| Professor | Civil engineering | Water resources |  |  | 7 |  |
| Professor | Civil engineering | Hydraulic Structures |  |  | 1 |  |
| Professor | Civil engineering | Soil and Foundation |  |  | 1 |  |
| Professor | Civil engineering | Soil mechanics |  |  | 1 |  |
| Professor | Civil engineering | Transportation |  |  | 1 |  |
| Professor | Civil engineering | Structures |  |  | 8 |  |
| Professor | Civil engineering | Municipal Engineering |  |  | 3 |  |
| Assistant Professor | Civil engineering | Structures |  |  | 17 |  |
| Assistant Professor | Civil engineering | Water resources |  |  | 1 |  |
| Assistant Professor | Civil engineering | Sanitary engineering |  |  | 2 |  |
| Assistant Professor | Civil engineering | Healthy Buildings |  |  | 2 |  |
| Assistant Professor | Civil engineering | Traffic engineering |  |  | 1 |  |
| Assistant Professor | Civil engineering | Project management |  |  | 1 |  |
| Lecturer | Civil engineering | Project management |  |  | 1 |  |
| Lecturer | Civil engineering | Structures |  |  | 11 |  |
| Lecturer | Civil engineering | Water Resources |  |  | 8 |  |
| Assistant Lecturer | Civil engineering | Water resources |  |  | 4 |  |
| Assistant Lecturer | Civil engineering | Project management |  |  | 1 |  |
| Assistant Lecturer | Civil engineering | Structures |  |  | 6 |  |

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| **Professional Development** |
| **Mentoring new faculty members** |
| Training courses in teaching method  Conduct a test of teaching validity |
| **Professional development of faculty members** |
| Attend training courses  Workshop  Attend Conference |

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| 1. **Acceptance Criterion** |
| **Central admission:**  The Civil Engineering Department is subject to the work mechanism of the Ministry of Higher Education and Scientific Research - Central Admission Department, where graduates of the preparatory school (scientific branch) are nominated for admission to the department based on the graduation rates. In addition, students are accepted in the parallel morning study as well as the evening study. Likewise, some of the top ten graduates of technical institutes are accepted, others from the top five percent of professional studies and some distinguished employees of state ministries. |

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| 1. **The most important sources of information about the program** |
| 1. The websites of Iraqi and foreign universities.  2. Scientific libraries.  3. Workshops held by the Ministry of Higher Education in addition to the Ministry's standards.  4. The American Academic Accreditation Program (ABET). |

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| 1. Program Development Plan |
| **-Based on Course Assessments and Fourth year students survey, add** new chapters, topics, or scientific experiments that fit the department’s objectives.  -Provide the student with self-learning skills through the nature of vocabulary, study curricula and approved teaching methods.  -Encouraging students to work as teams within practical projects that reflect the life reality of the community and its problems.  -Encouraging students to enter and participate in competitions, seminars and conferences that develop and develop their research ability and self-confidence for self-learning.  - Improve curriculums by adding more items like teamwork, leadership and modern technology. |

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| **Program Skills Outline** | | | | | | | | | | | | | | | |
|  | | | | **Required program Learning outcomes** | | | | | | | | | | | |
| **Year/Level** | **Course Code** | **Course Name** | **Basic or optional** | **Knowledge** | | | | **Skills** | | | | **Ethics** | | | |
| **A1** | **A2** | **A3** | **A4** | **B1** | **B2** | **B3** | **B4** | **C1** | **C2** | **C3** | **C4** |
| **First Year/1st Semester** | E122-1 | Mathematics I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE114 | Engineering Geology | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| E126 | Human rights and democracy | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| E115 | Chemistry | Basic | **√** | **√** | **√** |  | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** |
| CE124 | Building Material | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE131-1 | Engineering Mechanics-I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| U111 | English I | Basic |  | **√** | **√** |  |  | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| **First Year/2nd Semester** | CE131-2 | Engineering Mechanics | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| E116 | Engineering workshop | Basic |  |  |  |  |  |  |  |  |  |  |  |  |
| E122-2 | Mathematics I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| E128 | Physics | Basic | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| E125 | Engineering drawings | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| E125 | Computer software | Basic | **√** |  | **√** |  | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| U121 | Arabic language I | Basic |  |  |  |  |  |  |  |  |  |  |  |  |
| **Second Year/1st Semester** | E212-1 | Applied Mathematics | Basic | **√** | **√** |  |  | **√** | **√** |  |  | **√** | **√** | **√** | **√** |
| CE213-1 | Mechanics of Materials I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE214-1 | Fluid Mechanics I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE215-1 | Engineering Surveying I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE228 | Building Construction | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE217 | Computer Programming | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| U211 | Arabic language II | Basic |  |  |  |  |  |  |  |  |  |  |  |  |
| **Second Year/2nd Semester** | CE213-2 | Mechanics of Materials II | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE214-2 | Fluid Mechanics II | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE215-1 | Engineering Surveying II | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE216 | Concrete Technology | Basic | **√** | **√** | **√** | **√** | **√** |  |  |  | **√** | **√** | **√** | **√** |
| CE227 | Engineering Statistics | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| U211 | Al Baath Crimes | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| U213 | English II | Basic |  |  |  |  |  |  |  |  |  |  |  |  |
| **Third Year//1st Semester** | CE311-1 | Engineering Analysis | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE312-1 | Theory of Structures I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE313-1 | Soil Mechanics I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE314-1 | Reinforced Concrete Design I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE315-1 | Irrigation | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** |
| CE316-1 | Engineering Management | Basic | **√** | **√** | **√** |  | **√** | **√** |  |  | **√** | **√** | **√** | **√** |
| CE317-1 | Traffic Engineering | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE318-2 | Computer Applications I | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE311-2 | Numerical Analysis | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| **Third Year/2nd Semester** | CE312-2 | Theory of Structures II | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE313-2 | Soil Mechanics II | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE314-1 | Reinforced Concrete Design II | Basic | **√** | **√** | **√** |  | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE315-2 | Drainage | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** |
| CE316-2 | Engineering Economy | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  |  | **√** | **√** | **√** | **√** |
| CE317-2 | Transportation Engineering | Basic | **√** | **√** | **√** |  | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE318-2 | Computer Applications II | Basic | **√** |  |  |  | **√** |  |  |  | **√** | **√** | **√** | **√** |
| CE411 | Prestressed Concrete | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| **Fourth Year//1st Semester** | CE412-1 | Foundation Engineering I | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE413-1 | Steel Structures Design I | Basic | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE414 | Hydraulic Structures | Basic | **√** |  |  |  | **√** |  |  |  | **√** | **√** | **√** | **√** |
| CE415-1 | Highway Engineering | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE416-1 | Water Supply Engineering | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE417-1 | Construction Methods | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE420-2 | Engineering Project I | Basic |  |  |  |  |  |  |  |  |  |  |  |  |
| CE412-2 | Foundation Engineering II | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| **Fourth Year/ 2nd Semest** | CE413-2 | Steel Structures Design II | Basic | **√** | **√** | **√** |  | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE418 | Engineering Hydrology | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE415-1 | Highway Pavement Analysis & Design | Basic | **√** | **√** | **√** | **√** | **√** | **√** |  | **√** | **√** | **√** | **√** | **√** |
| CE416-2 | Sanitary Sewage Engineering | Basic | **√** | **√** | **√** |  | **√** | **√** |  |  | **√** | **√** | **√** | **√** |
| CE417-2 | Estimation and Specifications | Basic | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
| CE419 | Engineering Ethics | Basic | **√** | **√** | **√** |  | **√** | **√** |  |  | **√** | **√** | **√** | **√** |
| CE420-2 | Engineering project II | Basic |  |  |  |  |  |  |  |  |  |  |  |  |

* **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| --- | --- |
| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Mathematics 1 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 1st year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic methods of analyzing statically defined structures as an introduction to the analysis of undefined structures and structural design decisions. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Studying of the Cartesian coordinates and basics of analytic geometry.  A2- Learning group of methods to drawing functions by different manners.  A3- Using concept of limits and approximations to illustrate and understanding mathematic differential concepts.  A4- Using concept of limit to justify calculus and differentiation. |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving structural engineering problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to calculus | Numbers | Lecture | Written exam |
| 2 | 4 | Review | Definition of functions | Lecture | Written exam |
| 3 | 4 | Function basics | Drawing of functions | Lecture | Written exam |
| 4 | 4 | Applications to Drawing of functions | Assymptotes symmetry and infinity approaches | Lecture | Written exam |
| 5 | 4 | Introduction to Analytic geometry | Trigonometric functions | Lecture | Written exam |
| 6 | 4 | Limits | Approaches of numbers and L’Hopital’s rule | Lecture | Written exam |
| 7 | 4 | Introduction to Derivatives | Implicit differentiations | Lecture | Written exam |
| 8 | 4 | Derivative applications 1 | Sketctch the functions | Lecture | Written exam |
| 9 | 4 | Derivative applications 2 | Mean value theory and some applications | Lecture | Written exam |
| 10 | 4 | Transcendental Functions 1 | Exponential and Logarithmic Functions | Lecture | Written exam |
| 11 | 4 | Transcendental Functions 2 | Hyperbolic functions | Lecture | Written exam |
| 12 | 4 | Transcendental Functions 3 | DERIVATIVES OF EXP and LOG FUNCTIONS | Lecture | Written exam |
| 13 | 4 | Transcendental Functions 4 | Inverse trigonometric functions | Lecture | Written exam |
| 14 | 4 | Analytic geometry 1 | Conics | Lecture | Written exam |
| 15 | 4 | Analytic geometry 2 | Drawing the Conics | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books | Calculus, Thomas, Pearson Education 2005. |
| 2- Recommended books and references (scientific journals, reports ,.... | Any other Calculus and analytic geometry textbook. |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| There is no developing material for this course soon since the basic preliminary subjects here is the foundation and important entrance to the next study scientific materials for many stages and subjects, the developing of this material indeed depends on the developing of these courses for the next stages of engineering subjects. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Eng. Mechanic -static |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 1st year |
| 6. Number of hours tuition (total) | 75 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| To understand the procedure for analysis of static objects; concepts of force, moment, and mechanical equilibrium. To analyze forces and moments in two and three dimensions due to concentrated and distributed forces in various systems such as beams, frames and trusses. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  On successful completion of this course students will be able to:   |  |  | | --- | --- | | A1 | Define Newton's laws of motion and Recall trigonometric laws and apply to the addition and decomposition of vectors quantities. | | A2 | Identify the moment of a force and calculate its value about a specified axis. Define the moment of a couple. Describe the concept of dry friction and analyse the equilibrium of rigid bodies subjected to this force. | | A3 | Construct "Free Body Diagrams" of real-world problems and apply Newton's Laws of motion and vector operations to evaluate equilibrium of particles and bodies. Apply the principles of equilibrium of particles and bodies to analyse the forces in planar truss members. | | A4 | Discuss the concepts of ``centre of gravity'' and ``centroids'' and compute their location for bodies of arbitrary shape. Apply the concepts used for determining centre of gravity and centroids to find the resultant of a generally distributed loading. Use methods learnt for equilibrium of bodies and the resultant of a generally distributed loading to compute the internal forces in beams. Generalize the procedure to construct bending moments and shear force diagrams (internal forces) and utilise this information in engineering design. | |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving structural engineering problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 5 | Introduction | principles of statics | Lecture | Written exam |
| 2 | 5 | Force analysis | Force analysis | Lecture | Written exam |
| 3 | 5 | Force analysis | Force analysis | Lecture | Written exam |
| 4 | 5 | Force analysis | Force analysis | Lecture | Written exam |
| 5 | 5 | Equilibrium | Equilibrium | Lecture | Written exam |
| 6 | 5 | Equilibrium | Equilibrium | Lecture | Written exam |
| 7 | 5 | Equilibrium | Equilibrium | Lecture | Written exam |
| 8 | 5 | friction | friction | Lecture | Written exam |
| 9 | 5 | friction | friction | Lecture | Written exam |
| 10 | 5 | truss | truss | Lecture | Written exam |
| 11 | 5 | truss | truss | Lecture | Written exam |
| 12 | 5 | centroid | centroid | Lecture | Written exam |
| 13 | 5 | centroid | centroid | Lecture | Written exam |
| 14 | 5 | Moment of inertia | Moment of inertia | Lecture | Written exam |
| 15 | 5 | Moment of inertia | Moment of inertia | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Hibbeler R. C., Engineering Mechanics, Statics , 14th ed, 2015  2-M. E. Plesha, Engineering Mechanics Statics, 1st ed, 2010.  3-A. Bedford, Engineering Mechanics Statics, 5th ed, 2008 |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides general information for using the tools and concept of engineering drawing, teaching drawing lines, their types and use, and drawing geometric shapes with the method of placing dimensions. The course contributes to reading engineering plans and how to deduce details and measurements of work from the course using the paper plan or using computer-aided engineering drawing programs. |

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| 1. Teaching Institution | Basrah University |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Drawing 1 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 1st year |
| 6. Number of hours tuition (total) | 90 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * It is noticeable that facilities, buildings and construction projects have developed significantly in recent years, and accordingly, the methods of presenting ideas and engineering plans have evolved, and a great deal has been relied on modern technologies such as computers and engineering programs in the presentation of engineering plans. Therefore, this course aims to introduce the student to the methods and tools of paper engineering drawing, how to read diagrams, and ways to find dimensions or shapes that are not shown in the diagram through some of the engineering processes and ideas of engineering drawing. This course is also an important introduction to computer applications of engineering drawing, as the civil engineering specialist will not be able to make the most of the computer unless he is fully familiar with the subject of engineering drawing. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of engineering drawing by defining the tools for drawing and how to use them and how to deduce civil dimensions and shapes from drawings and diagrams.  A2- Acquisition of skills in addressing site engineering problems.  A3- Acquiring basic skills as an introduction to building a successful civil engineer.  A4- Gain a basic understanding of engineering designs and their various industrial and construction applications.  . |
| B. Subject-specific skills  B1 - The ability to draw sections and geometric shapes.  B2 - he ability to think about finding dimensions and deducing missing shapes for any structure or geometric shape.  B3 - Writing detailed scientific reports for engineering plans.  B4 - The ability to gain experience in dealing with executive engineering plans. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |

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| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 6 |  |  | General information for the use of tools and the concept of engineering drawing | Class work |
| 2 | 6 |  |  | Class work |
| 3 | 6 |  |  | Class work |
| 4 | 6 |  |  | Teaching drawing lines and their types | Class work |
| 5 | 6 |  |  | Class work |
| 6 | 6 |  |  | engineering operations | Class work |
| 7 | 6 |  |  | Class work |
| 8 | 6 |  |  | Class work |
| 9 | 6 |  |  | Dimensions | Class work |
| 10 | 6 |  |  | applications | Class work |
| 11 | 6 |  |  | Class work |
| 12 | 6 |  |  | Class work |
| 13 | 6 |  |  | projection drawing | Class work |
| 14 | 6 |  |  | Class work |
| 15 | 6 |  |  | Class work |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Engineering drawing written by Abdul Rasoul Al Khaffaf  Descriptive geometry written by Jassim Shehab |
| 2. Key references (sources) | Engineering drawing by French |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Physics: The course provides general information about physics in its many branches such as mechanics, physics, thermodynamics, electricity, magnetism, quantum mechanics and relativity. It should be noted that some laws, such as Newton's law of motion and conservation of energy |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Physics |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 1st year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * All phenomena in the natural world are measured in terms of a few basic relationships between measurable properties of matter and energy. These relationships are called laws of physics, and they are formulas that are characterized by a high degree of generality and are derived from a large number of phenomena. The goal of physics can be summarized as expressing these basic relationships (these laws) in a mathematical form, so that the student can use the logical rules of mathematics to apply the laws to specific cases and thus obtain quantitative results. The most important laws of physics are in the field of civil engineering, which requires the engineer to know these laws for the purpose of reflecting them on the engineering reality related to mathematics, engineering foundations, fluid movement, hydraulic installations, and others. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of physics.  A2- Acquisition of skills in dealing with and understanding the laws of physics in a simplified manner.  A3- Acquire basic skills as an introduction to the physical properties necessary to describe all measurements physical. These properties, called dimensions, are length, mass, time, temperature, and electric current. The number of particles and luminous intensity. And the derivation of other physical quantities such as force, energy and momentum |
| B. Subject-specific skills  B1 - The ability to know and understand physics  B2 - The ability to think about a solution to any problem.  B3 - Writing scientific reports.  B4 - The ability to gain experience in dealing with physical quantities. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |

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| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 |  |  | introduction | Class work |
| 2 | 2 |  |  | Physics tools Importance of physics | Class work and quiz |
| 3 | 2 |  |  | Class work |
| 4 | 2 |  |  | uniform linear motion | Class work and quiz |
| 5 | 2 |  |  | Class work |
| 6 | 2 |  |  | Ballistic movement | Class work |
| 7 | 2 |  |  | Newton's laws of motion | Class work |
| 8 | 2 |  |  | Class work and quiz |
| 9 | 2 |  |  | Mass and its relationship to weight | Class work |
| 10 | 2 |  |  | Friction and friction forces | Class work |
| 11 | 2 |  |  | movement in a circle | Class work |
| 12 | 2 |  |  | Equations of Angular Motion | Class work and quiz |
| 13 | 2 |  |  | Centripetal wheel | Class work |
| 14 | 2 |  |  | Newton's law of gravitation | Class work |
| 15 | 2 |  |  | orbital motion | Class work |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| --- | --- |
| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Geology |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 1st year |
| 6. Number of hours tuition (total) | 60 hrs. |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to provide basic information about the components of the earth's crust, types of rocks, forms of geological structures, factors and forces that affect the earth's crust, earthquakes, volcanoes, the natural properties of soil and subsurface water geology as an introduction to studying the geology of tunnels, dams and reservoirs sites, and the use of geological maps and geological survey. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Introducing the concept of engineering geology and its importance in knowing the origin, history and formation of the sphere Earth and the forces acting on its rocks.  A2- Determining the environmental problems resulting from geological phenomena, their causes, and ways to reduce their effects.  A3- Describe engineering methods for analyzing and designing systems that help solve foundation geological problems.  A4- Clarify the sources of groundwater and their relationship to surface water and how to avoid its risks during implementation Engineering Works. Explain the methods of drawing topographic sections and knowing the thickness of the layers of the earth's surface. A6- Determining the required investigation methods for the locations of important buildings and facilities and the type of geological phenomena influential. |
| B. Subject-specific skills  B1 - Analyzing the natural phenomena that are important in realizing the reality of the components of the Earth  B 2 - Choosing engineering decisions in knowing the movement of ground water and explaining the factors affecting it  B3 - Designing illustrative geological maps of the Earth's surface layers and their uses in civil engineering  B4 - Using the concept of metal detection in the earth's crust and analyzing its components and their relationship to foundations Facilities |
| Teaching and Learning Methods |
| •Theoretical lectures, practical lectures, small discussion groups, presentation of scientific films, and writing reports. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |

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| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2  2 | Definition of geology  Earth Structure | Engineering Geology | Th. Lecture  Prac. Lecture | Written exam |
| 2 | 2  2 | Mineral groups | Minerals | Th. Lecture  Prac. Lecture | Written exam |
| 3 | 2  2 | Physical properties of minerals | Minerals | Th. Lecture  Prac. Lecture | Written exam |
| 4 | 2  2 | Physical and engineering properties of rocks | Rocks | Th. Lecture  Prac. Lecture | Written exam |
| 5 | 2  2 | Rock cycle geological structures | Rocks | Th. Lecture  Prac. Lecture | Written exam |
| 6 | 2  2 | Earthquakes  Volcanoes | Rocks | Th. Lecture  Prac. Lecture | Written exam |
| 7 | 2  2 | Geological origin and properties of soil and rivers | Soil and river geology | Th. Lecture  Prac. Lecture | Written exam |
| 8 | 2  2 | Transport and sedimentation in rivers | Soil and river geology | Th. Lecture  Prac. Lecture | Written exam |
| 9 | 2  2 | The origin and sources of subsurface water | subsurface water geology | Th. Lecture  Prac. Lecture | Written exam |
| 10 | 2  2 | subsurface water movement  Artesian wells | subsurface water geology | Th. Lecture  Prac. Lecture | Written exam |
| 11 | 2  2 | topographic maps | geological maps | Th. Lecture  Prac. Lecture | Written exam |
| 12 | 2  2 | contour lines | geological maps | Th. Lecture  Prac. Lecture | Written exam |
| 13 | 2  2 | Topographic Profile & vertical section | geological maps | Th. Lecture  Prac. Lecture | Written exam |
| 14 | 2  2 | Geological and geotechnical investigations of engineering building sites | Geological and geotechnical investigations of engineering building sites | Th. Lecture  Prac. Lecture | Written exam |
| 15 | 2  2 | Engineering geology and foundation problems | Geological and geotechnical investigations of engineering building sites | Th. Lecture  Prac. Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. PRINCIPL OF ENGINEERING GEOLOGY & PRACTICES, AL-TAI MAJID ABOUD JASSIM |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| English Language: The course provides general information about English grammar and how to form sentences and tenses. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | English |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 1st year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Develop students' skills to speak English in terms of sentence formation and pronunciation. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of the English language by defining the tools for grammar, formulating sentences, texts and pronunciation.  A2- Acquisition of skills in speaking and writing research and reports. |
| B. Subject-specific skills  B1 - The ability to read.  B2 - The ability to write.  B3 - The ability to gain experience in dealing with foreign companies. |

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| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 |  | Sequence |  | Class |
| 2 | 2 |  | Contrast |  | Class |
| 3 | 2 |  | Cause and consequence |  | Class and quiz |
| 4 | 2 |  | Reading |  | Class |
| 5 | 2 |  | Comparisons |  | Class and quiz |
| 6 | 2 |  |  | Class |
| 7 | 2 |  | Reading |  | Class and quiz |
| 9 | 2 |  | Nouns |  | Class |
| 8 | 2 |  |  | Class and quiz |
| 10 | 2 |  | Reading |  | Class |
| 11 | 2 |  | Pronouns |  | Class and quiz |
| 12 | 2 |  |  | Class |
| 13 | 2 |  | Passive |  | Class and quiz |
| 14 | 2 |  | Impersonal Passive |  | Class |
| 15 | 2 |  | Reading |  | Class and quiz |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) | New Headway\_ Beginner A1\_ Workbook |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Mathematics 2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 1st year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic methods of analyzing statically defined structures as an introduction to the analysis of undefined structures and structural design decisions. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Learning basic concepts of integration and the scientific justification.  A2- Learning group of methods of integration and some techniques for some templates and functions.  A3- Using integration to solve some physical and engineering problems.  A4- Studying of an introduction to linear algebra and solving some equations related to engineering systems and an introduction of numerical analysis. |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving structural engineering problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to integration | Definitions | Lecture | Written exam |
| 2 | 4 | Applications on Integration 1 | Area under curves | Lecture | Written exam |
| 3 | 4 | Applications on Integration 2 | Area between curves | Lecture | Written exam |
| 4 | 4 | Applications on Integration 3 | Volumes by revolutions about axes | Lecture | Written exam |
| 5 | 4 | Applications on Integration 4 | Surface areas and length of curves | Lecture | Written exam |
| 6 | 4 | Integration of some complex function | Logarithmic. exponential and trigonometric functions | Lecture | Written exam |
| 7 | 4 | Method of integration 1 | Substitution methods | Lecture | Written exam |
| 8 | 4 | Method of integration 2 | Some techniques for trigonometric functions | Lecture | Written exam |
| 9 | 4 | Method of integration 3 | Integration by parts 1 | Lecture | Written exam |
| 10 | 4 | Method of integration 4 | Integration by parts 2 | Lecture | Written exam |
| 11 | 4 | Method of integration 5 | Partial fraction method | Lecture | Written exam |
| 12 | 4 | Method of integration 6 | Trigonometric substitutions 1 | Lecture | Written exam |
| 13 | 4 | Method of integration 7 | Trigonometric substitutions 1 | Lecture | Written exam |
| 14 | 4 | Matrices 2 | Basics of matrices | Lecture | Written exam |
| 15 | 4 | Matrices 2 | Solving algebraic linear systems | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books | Calculus, Thomas, Pearson Education 2005. |
| 2- Recommended books and references (scientific journals, reports ,.... | Any other Calculus and analytic geometry textbook. |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| There is no developing material for this course soon since the basic preliminary subjects here is the foundation and important entrance to the next study scientific materials for many stages and subjects, the developing of this material indeed depends on the developing of these courses for the next stages of engineering subjects. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Studying the continuous motion of a particle on linear, curvilinear and circular path. Applying the principle of constant acceleration on the motion of projectiles. Discussing the Newton’s law for mass and acceleration and its relation with constant acceleration. Studying the principles of work and energy, and impulse and momentum. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Mechanics : Dynamic |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 1rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to study the principles of motion as an introduction to study the structural dynamic. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Applying the principles distance, velocity and acceleration on motion of particles in linear, circular and curvilinear paths.  A2- Applying the principle of constant acceleration on the motion of projectiles.  A3- Applying the Newton’s law for mass and acceleration.  A4- Introduction to work and energy, and impulse and momentum. |
| B. Subject-specific skills  B1 - Apply the principles of motion on the motion of particles.  B2 - Use basic knowledge to research new technologies.  B3 – Studying the principles of structural dynamic. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to Dynamic | Introduction to Dynamic | Lecture | Written exam |
| 2 | 4 | **Rectilinear Kinematics: Continuous Motion** | **Continuous Motion** | Lecture | Written exam |
| 3 | 4 | **Rectilinear Kinematics: Continuous Motion** | **Continuous Motion** | Lecture | Written exam |
| 4 | 4 | **Rectilinear Kinematics: Continuous Motion** | **Motion of Projectiles** | Lecture | Written exam |
| 5 | 4 | **Rectilinear Kinematics: Continuous Motion** | **Curvilinear Motion** | Lecture | Written exam |
| 6 | 4 | **Coplanar Angular Motion of a Line** | **Motion of a Line** | Lecture | Written exam |
| 7 | 4 | **Coplanar Angular Motion of a Line** | **Motion on circular path** | Lecture | Written exam |
| 8 | 4 | **Kinetics of Rigid Body: Planar Kinetics Equation of Motion** | **Rectilinear Translation** | Lecture | Written exam |
| 9 | 4 | **Kinetics of Rigid Body: Planar Kinetics Equation of Motion** | **Curvilinear Translation** | Lecture | Written exam |
| 10 | 4 | **Work and Energy** | Work of a force | Lecture | Written exam |
| 11 | 4 | **Work and Energy** | **Principle of Work and Energy** | Lecture | Written exam |
| 12 | 4 | **Work and Energy** | **Principle of Work a n d Energy for a System of Particles** | Lecture | Written exam |
| 13 | 4 | **Work and Energy** | Power and Efficiency | Lecture | Written exam |
| 14 | 4 | **Impulse and Momentum** | **Principle of Linear Impulseand Momentum** | Lecture | Written exam |
| 15 | 4 | **Impulse and Momentum** | **Principle of Linear Impulseand Momentum for a System of Particles** | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1.Engineering Mechanics, Higdon  2. Engineering Mechanics: Daynamic, R.C. Hibbeler, Prentice Hall. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | Engineering Mechanics: Daynamic, R.C. Hibbeler, Prentice Hall. |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Chemistry |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 1st year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic methods in explaining the behavior of various types of materials in terms of their chemical structures. The focus is on the application of chemical principles and their relationship to civil engineering. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Studying and knowing the types of cement, the chemical properties and the equations involved in its formation.  A2- Study and understanding water and its chemical properties and equations in its composition and water suitable for concrete mix.  A3- Studying and knowing the types of lime and gypsum and the chemical properties and equations involved in its formation. |
| B. Subject-specific skills  B1 - Apply chemical equations for the purpose of knowing the chemical properties involved in structural engineering.  B2 - Use basic knowledge to research new chemical techniques.  B3 - Derive and evaluate the equations needed to apply in structural engineering analysis methods. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Chemical analysis skills for materials involved in civil engineering by lecturers through small study groups, evaluation and response to all submitted work. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 2 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 3 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 4 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 5 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 6 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 7 | 3 | Chapter One | Cement (composition and types) | Lecture | Written exam |
| 8 | 3 | Chapter Two | Lime and gypsum | Lecture | Written exam |
| 9 | 3 | Chapter Two | Lime and gypsum | Lecture | Written exam |
| 10 | 3 | Chapter Two | Lime and gypsum | Lecture | Written exam |
| 11 | 3 | Chapter Two | Lime and gypsum | Lecture | Written exam |
| 12 | 3 | Chapter Three | Water and its composition | Lecture | Written exam |
| 13 | 3 | Chapter Three | Water and its composition | Lecture | Written exam |
| 14 | 3 | Chapter Three | Water and its composition | Lecture | Written exam |
| 15 | 3 | Chapter Three | Water and its composition | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites |  |

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| 12. Course development plan |
| Expanding the study of the chemical composition of engineering materials included in the study of civil engineering and its divisions of construction and water and its chemical and engineering equations |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides general information for using the tools and concept of engineering drawing, teaching drawing lines, their types and use, and drawing geometric shapes with the method of placing dimensions. The course contributes to reading engineering plans and how to deduce details and measurements of work from the course using the paper plan or using computer-aided engineering drawing programs. |

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| 1. Teaching Institution | Basrah University |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Drawing 2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 1st year |
| 6. Number of hours tuition (total) | 90 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * It is noticeable that facilities, buildings and construction projects have developed significantly in recent years, and accordingly, the methods of presenting ideas and engineering plans have evolved, and a great deal has been relied on modern technologies such as computers and engineering programs in the presentation of engineering plans. Therefore, this course aims to introduce the student to the methods and tools of paper engineering drawing, how to read diagrams, and ways to find dimensions or shapes that are not shown in the diagram through some of the engineering processes and ideas of engineering drawing. This course is also an important introduction to computer applications of engineering drawing, as the civil engineering specialist will not be able to make the most of the computer unless he is fully familiar with the subject of engineering drawing. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of engineering drawing by defining the tools for drawing and how to use them and how to deduce civil dimensions and shapes from drawings and diagrams.  A2- Acquisition of skills in addressing site engineering problems.  A3- Acquiring basic skills as an introduction to building a successful civil engineer.  A4- Gain a basic understanding of engineering designs and their various industrial and construction applications.  . |
| B. Subject-specific skills  B1 - The ability to draw sections and geometric shapes.  B2 - he ability to think about finding dimensions and deducing missing shapes for any structure or geometric shape.  B3 - Writing detailed scientific reports for engineering plans.  B4 - The ability to gain experience in dealing with executive engineering plans. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 6 |  |  | Third Projection Conclusion | Class work |
| 2 | 6 |  |  | Class work |
| 3 | 6 |  |  | Class work |
| 4 | 6 |  |  | Isometric Drawing | Class work |
| 5 | 6 |  |  | Class work |
| 6 | 6 |  |  | Drawing of Sections | Class work |
| 7 | 6 |  |  | Class work |
| 8 | 6 |  |  | Class work |
| 9 | 6 |  |  | Principles of structural drawing | Class work |
| 10 | 6 |  |  | Class work |
| 11 | 6 |  |  | Class work |
| 12 | 6 |  |  | Class work |
| 13 | 6 |  |  | principles of descriptive geometry | Class work |
| 14 | 6 |  |  | Class work |
| 15 | 6 |  |  | Class work |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Engineering drawing written by Abdul Rasoul Al Khaffaf  Descriptive geometry written by Jassim Shehab |
| 2. Key references (sources) | Engineering drawing by French |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Building materials: The course provides general information about engineering materials used in construction, which have an effective role and special importance in any technological progress in all aspects of life, research and study of their properties, and the possibility of testing the best and most appropriate of these materials to match the conditions of their use in all required engineering works. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Construction materials |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 1st year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The study of engineering subjects has an effective role and special importance in any technological progress in all fields. Therefore, engineering subjects are the main entity for various engineering works. Therefore, this course aims to introduce the student to the different types of engineering materials and to study the study of their properties and the possibility of testing the best and most appropriate of these materials in line with the conditions of their use in all required engineering works. As the civil engineering student can deal correctly with engineering materials with high capacity and efficiency in all steps of any engineering work. It is required to implement it on the ground to reach the highest technical and technical levels. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Knowing the properties of materials and the necessary tests for the purpose of testing their efficiency.  A2- Acquisition of skills in handling work problems.  A3- Acquisition of basic skills in selecting the appropriate materials for the implementation of the facility so as to ensure the safety of construction at the lowest possible cost  A4- Acquisition of skill in the correct handling of engineering materials with high capacity and efficiency in all steps of any Engineering work required to be implemented on the ground. |
| B. Subject-specific skills  B1-The ability to choose the appropriate materials to implement the structure so as to ensure the safety of the construction at the lowest possible cost.  B2 - The ability to think about addressing work problems on the ground during the design or construction of any building.  B3 - Writing scientific reports.  B4 - The ability to gain experience in dealing with engineering materials used in construction. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |

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| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 |  |  | Introduction | Class work |
| 2 | 4 |  |  | Classification of engineering materials | Class work and quiz |
| 3 | 4 |  |  | General properties of engineering materials | Class work |
| 4 | 4 |  |  | Physical properties | Class work and quiz |
| 5 | 4 |  |  | Physical properties | Class work |
| 6 | 4 |  |  | Mechanical properties: types of loading | Class work |
| 7 | 4 |  |  | Mechanical properties: stress  strain  Boson ratio | Class work |
| 8 | 4 |  |  | Mechanical properties: stress-strain curve | Class work and quiz |
| 9 | 4 |  |  | Modulus of elasticity or Yonk's modulus | Class work |
| 10 | 4 |  |  | Mechanical properties of engineering materials | Class work |
| 11 | 4 |  |  | Mechanical properties of engineering materials | Class work |
| 12 | 4 |  |  | models of engineering materials  Bricks  and wood | Class work |
| 13 | 4 |  |  | Models of engineering materials bonding materials | Class work and quiz |
| 14 | 4 |  |  | Models of engineering materials iron materials | Class work |
| 15 | 4 |  |  | Models of Alkashi engineering materials | Class work |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) | Properties and testing of building materials  Building materials and raw materials used in construction |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Computer Science |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 1st year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the computer science in general and makes students familiar with Hardware and general software, and then learn the more specific software that engineering students and engineers mostly used like calculating and reporting programs to be more prepared for engineering analysis and design programs in future stages. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Identifying the two main parts of computer science (the hardware and software) their characteristics and functions.  A2- Studying the most essential software starting from the operating system Windows then the office package like Word, Excel and Power Point to be qualify for editing and presenting data. |
| B. Subject-specific skills  B1 – Identifying the basic functions of different parts of hardware components.  B2 – Practicing the operating system to accomplish different tasks and managing the other programs.  B3 – Getting the necessary skills in the most essential software that all engineering students and engineers are need. |
| Teaching and Learning Methods |
| • The theoretical lectures are presenting the essential data and concepts that students are necessarily learned, then the laboratory lectures make practice use of the theoretical lectures and test the different algorithms and tasks on computer, doing the exercises and test the homework. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | Introduction to computer | Development of Computer | Lecture | Written exam |
| 1 | 2 | Introduction to Computer | Computer Main Parts | Laboratory | Evaluation |
| 2 | 2 | Introduction to Computer | Hardware Components and Functions | Lecture | Written exam |
| 2 | 2 | Introduction to Computer | Hardware Components and Functions | Laboratory | Evaluation |
| 3 | 2 | Flowcharts and Algorithms | Flowcharts and Algorithms | Lecture | Written exam |
| 3 | 2 | Flowcharts and Algorithms | Flowcharts and Algorithms | Laboratory | Evaluation |
| 4 | 2 | Flowcharts and Algorithms | Flowcharts and Algorithms | Lecture | Written exam |
| 4 | 2 | Flowcharts and Algorithms | Flowcharts and Algorithms | Laboratory | Evaluation |
| 5 | 2 | Windows | Windows | Lecture | Written exam |
| 5 | 2 | Windows | Windows | Laboratory | Evaluation |
| 6 | 2 | Windows | Windows | Lecture | Written exam |
| 6 | 2 | Windows | Windows | Laboratory | Evaluation |
| 7 | 2 | Microsoft Word | Microsoft Word | Lecture | Written exam |
| 7 | 2 | Microsoft Word | Microsoft Word | Laboratory | Evaluation |
| 8 | 2 | Microsoft Word | Microsoft Word | Lecture | Written exam |
| 8 | 2 | Microsoft Word | Microsoft Word | Laboratory | Evaluation |
| 9 | 2 | Microsoft Word | Microsoft Word | Lecture | Written exam |
| 9 | 2 | Microsoft Word | Microsoft Word | Laboratory | Evaluation |
| 10 | 2 | Microsoft Excel | Microsoft Excel | Lecture | Written exam |
| 10 | 2 | Microsoft Excel | Microsoft Excel | Laboratory | Evaluation |
| 11 | 2 | Microsoft Excel | Microsoft Excel | Lecture | Written exam |
| 11 | 2 | Microsoft Excel | Microsoft Excel | Laboratory | Evaluation |
| 12 | 2 | Microsoft Excel | Microsoft Excel | Lecture | Written exam |
| 12 | 2 | Microsoft Excel | Microsoft Excel | Laboratory | Evaluation |
| 13 | 2 | Microsoft Power Point | Microsoft Power Point | Lecture | Written exam |
| 13 | 2 | Microsoft Power Point | Microsoft Power Point | Laboratory | Evaluation |
| 14 | 2 | Microsoft Power Point | Microsoft Power Point | Lecture | Written exam |
| 14 | 2 | Microsoft Power Point | Microsoft Power Point | Laboratory | Evaluation |
| 15 | 2 | Microsoft Power Point | Microsoft Power Point | Lecture | Written exam |
| 15 | 2 | Microsoft Power Point | Microsoft Power Point | Laboratory | Evaluation |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Computer Essentials and Office Applications-Part I & II – Dr. Ghassan Hameed |
| 2. Key references (sources) | Up to date books for learning computers and latest software versions |
| A- Recommended books and references (scientific journals, reports ,.... | Libraries of different universities |
| B- Electronic references, websites | General websites |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Applied Mathematics 1 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present polar coordinates and vectors and their applications in engineering. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Study polar coordinates and their relation to Cartesian coordinates and their applications.  A2- Define vectors and use them to study the analytic geometry of space with their important applications in engineering. |
| B. Subject-specific skills  B1 – Graphing in Polar coordinates, calculating areas and lengths of curves using polar coordinates.  B2 - Study the analytic geometry of space using vectors. Vectors provide simple ways to define equations for lines, planes, curves, and surfaces in space with their many important applications in science, engineering. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Definition of Polar Coordinates | Definition of Polar Coordinates | Lecture | Written exam |
| 2 | 4 |  | Polar Equations and Graphs | Lecture | Written exam |
| 3 | 4 |  | Relating Polar and Cartesian Coordinates | Lecture | Written exam |
| 4 | 4 | Graphing Polar Coordinate Equations | Symmetry and Slope | Lecture | Written exam |
| 5 | 4 | Areas and Lengths in Polar Coordinates | Area in the Plane | Lecture | Written exam |
| 6 | 4 |  | Length of a Polar Curve | Lecture | Written exam |
| 7 | 4 | Vectors and the  Geometry of Space | Three-Dimensional Coordinate Systems | Lecture | Written exam |
| 8 | 4 | Vectors | Component Form and Vector Algebra Operations | Lecture | Written exam |
| 9 | 4 |  | Unit Vectors | Lecture | Written exam |
| 10 | 4 |  | Midpoint of a Line Segment | Lecture | Written exam |
| 11 | 4 | Applications | Navigation, forces action on a single object | Lecture | Written exam |
| 12 | 4 | The Dot Product | Angle Between Vectors, orthogonal Vectors, work and Vector Projections | Lecture | Written exam |
| 13 | 4 | The Cross Product | Calculating the Cross Product as a determinant, Area of a Parallelogram and Torque | Lecture | Written exam |
| 14 | 4 | Lines and Planes in Space | Lines and Line Segments in Space, The Distance from a Point to a Line in Space | Lecture | Written exam |
| 15 | 4 |  | An Equation for a Plane in Space, Lines of Intersection, The Distance from a Point to a Plane | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Thomas’ Calculus, George B. Thomas, Jr. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Mechanics of Materials -I |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic principles to calculate the normal stresses and strains. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Calculating stresses and strains in axially loaded bodies.  A2 Calculate the stresses caused by temperature changes.  A3- Calculation of stresses in thin-walled cylinders.  A4- Calculate the stresses resulting from torsion. Calculation of the principal stresses and planes. |
| B. Subject-specific skills  B1- Applying analytical and numerical methods for the purpose of solving mechanics of materials problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction stress and strain | Normal stress and strain | Lecture | Written exam |
| 2 | 4 | Introduction stress and strain | Normal stress and strain | Lecture | Written exam |
| 3 | 4 | Applications to Axially Loaded Members | Axially Loaded Members | Lecture | Written exam |
| 4 | 4 | Applications to Axially Loaded Members | Axially Loaded Members | Lecture | Written exam |
| 5 | 4 | Introduction to Thermal stress in axially loaded members | Thermal Stresses | Lecture | Written exam |
| 6 | 4 | Introduction to Thermal stress in axially loaded members | Thermal Stresses | Lecture | Written exam |
| 7 | 4 | Introduction to concepts Thin-Walled Cylinders | Thin Wall Cylinders | Lecture | Written exam |
| 8 | 4 | Introduction to concepts Thin-Walled Cylinders | Thin Wall Cylinders | Lecture | Written exam |
| 9 | 4 | Shear Stresses resulting from Torsion | Torsion | Lecture | Written exam |
| 10 | 4 | Shear Stresses resulting from Torsion | Torsion | Lecture | Written exam |
| 11 | 4 | Shear Stresses resulting from Torsion | Torsion | Lecture | Written exam |
| 12 | 4 | Introduction to stress transformation and principal stresses | Stress Transformation | Lecture | Written exam |
| 13 | 4 | Introduction to stress transformation and principal stresses | Stress Transformation | Lecture | Written exam |
| 14 | 4 | Introduction to stress transformation and principal stresses | Stress Transformation | Lecture | Written exam |
| 15 | 4 | Introduction to stress transformation and principal stresses | Stress Transformation | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1.Strength of Materials.  2. Mechanics of Materials , R.C. Hibbeler. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Adding practical laboratory hours to conduct mechanics of material experiments |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Fluid Mechanics - 1 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 45 theoretical hours and 30 practical hours |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims for studying the basic methods to understand the stability of fluids (liquid and gases) and the physical properties of the fluids. In addition, it provides a studying the fluids at the state of rest or relative rest and finding the resulting pressures and forces. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Understanding the physical properties of fluids such as density, viscosity, compressibility, surface tension, and capillarity.  A2- Methods for calculating the pressure of fluids at rest (statics).  A3-Methods for calculating the hydrostatic forces for fluids at rest or relative rest.  A4- Methods for calculating the buoyant forces. Introduction to the continuity and energy equations. |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for solving fluid mechanics problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | The properties of fluids | Definition of a fluid, density , specific weight and specific gravity | Lecture | Written exam |
| 2 | 3 | The properties of fluids | Viscosity, pressure and perfect gas, vapor pressure, and surface tension | Lecture | Written exam |
| 3 | 3 | Forces, stresses and pressure at a point | Fluid Statics | Lecture | Written exam |
| 4 | 3 | Basic equation of fluid statics | Fluid Statics | Lecture | Written exam |
| 5 | 3 | Units and scale of pressure measurements, manometers | Fluid Statics | Lecture | Written exam |
| 6 | 3 | Forces on plane surfaces | Fluid Statics | Lecture | Written exam |
| 7 | 3 | Forces components on curved surfaces | Fluid Statics | Lecture | Written exam |
| 8 | 3 | Buoyant forces | Buoyancy | Lecture | Written exam |
| 9 | 3 | Stability of floating and submerged bodies | Buoyancy | Lecture | Written exam |
| 10 | 3 | Fluid masses subjected to a constant acceleration | Horizontal, Vertical, and Inclined accelerations | Lecture | Written exam |
| 11 | 3 | Fluid masses subjected to a constant acceleration | Rotational acceleration | Lecture | Written exam |
| 12 | 3 | Fluid Dynamics | Types of fluid, Types of flow | Lecture | Written exam |
| 13 | 3 | Fluid Dynamics | Continuity equation | Lecture | Written exam |
| 14 | 3 | Equation of fluid motion | Energy conservation and Bernoulli’s equation | Lecture | Written exam |
| 15 | 3 | Equation of fluid motion | Energy conservation and Bernoulli’s equation | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1.Fluid Mechanics by Streeter &Wylie  2. ميكانيك الموائع د نزار السبتي. |
| 2. Key references (sources) | 1- Fluid Mechanics for Engineer by Albertson, Barton &Simons  2- Fluid Mechanics & Hydraulics (Schaums series) by Giles |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | * Reputable websites. * Libraries sites in some international universities |
| 12. Course development plan | |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Surveying I |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Qualifying the students of the second stage to be a scientific base that helps the student to carry out cadastral applications through the use of traditional and modern techniques in the design and implementation of vertical and horizontal tuning networks of various degrees Compiling, designing and producing maps of all kinds from ground and aerial surveys and conducting surveys High-precision engineering projects (dams, reservoirs, bridges, tunnels, laboratories, roads and airports) | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Application of distance measurement methods using tape  A2- Applying the method of measuring vertical distances using a leveling device.  A3- Conducting the settlement and investigational settlement process between the reference points and points. Applying measurement methods in making all calculations and tables of longitudinal sections. Applying measurement methods in making all calculations and tables of longitudinal and transverse sections.  A4- Extracting and comparing the magnetic and real directions of the lines and shapes. |
| B. Subject-specific skills  B1 - the work of surveying projects.  B2 - Making networks of ground control points.  B3 - Making all kinds of cadastral maps. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. And through lecture, workshop, laboratory, field training, summer training. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 5 | Introduction to Surveying Science | Surveying | Lecture and Lab | Quizzes and mid term exams |
| 2 | 5 | Measurements using the Tape | Tape | Lecture and Lab | Quizzes and mid term exams |
| 3 | 5 | Measurements using the Tape | Tape | Lecture and Lab | Quizzes and mid term exams |
| 4 | 5 | Applications to Leveling | Leveling | Lecture and Lab | Quizzes and mid term exams |
| 5 | 5 | Applications to Leveling | Validating Leveling | Lecture and Lab | Quizzes and mid term exams |
| 6 | 5 | Application of Sections | Longitudinal sections | Lecture and Lab | Quizzes and mid term exams |
| 7 | 5 | Application of Sections | Cross Sections | Lecture and Lab | Quizzes and mid term exams |
| 8 | 5 | Application of Sections | Cross Sections | Lecture and Lab | Quizzes and mid term exams |
| 9 | 5 | Angles Measurements | Using Theodolite | Lecture and Lab | Quizzes and mid term exams |
| 10 | 5 | Angles Measurements | Using Theodolite | Lecture and Lab | Quizzes and mid term exams |
| 11 | 5 | Angles Measurements | Using Theodolite | Lecture and Lab | Quizzes and mid term exams |
| 12 | 5 | Application of directions | Directions | Lecture and Lab | Quizzes and mid term exams |
| 13 | 5 | Application of directions | Directions | Lecture and Lab | Quizzes and mid term exams |
| 14 | 5 | Application of directions | Directions | Lecture and Lab | Quizzes and mid term exams |
| 15 | 5 | Application of directions | Directions | Lecture and Lab | Quizzes and mid term exams |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Surveying applications by Yaseen Obead |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Include GIS and remote sensing in lectures |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Concrete Technology |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the fundamentals of concrete technology with special focus on cement, aggregate and concrete properties including the process of manufacturing of cement. This is to pave the way for student to learn more aspect about concrete technology in the second semester. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Introduction to cement and aggregate including cement hydration  A2- manufacture of concrete.  A3- strength of concrete |
| B. Subject-specific skills  B1 – calculation of various aggregate moisture contents  B2 – Methods of workability measurement  B3 – Methods of manufacturing, delivering and placing of concrete |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to cement and aggregates | - Concrete Definition and Historical Development,  Characteristics of Concrete | Lecture and Lab | Written exam |
| 2 | 4 | Introduction to cement and aggregates | Types of Concrete,  Factors Influencing Concrete Properties | Lecture and Lab | Written exam |
| 3 | 4 | Cementitious Binders | Classification of binders, Manufacture of Portland cement | Lecture and Lab | Written exam |
| 4 | 4 | Cementitious Binders | Hydration | Lecture and Lab | Written exam |
| 5 | 4 | Cementitious Binders | Types of Portland cements, The role of water, Basic tests of Portland cement | Lecture and Lab | Written exam |
| 6 | 4 | Cementitious Binders | Geopolymers, Magnesium phosphoric cement (MPC), Magnesium oxychloride cement | Lecture and Lab | Written exam |
| 7 | 4 | Aggregates | Effects of aggregates, Classification of aggregates, Properties of aggregates | Lecture and Lab | Written exam |
| 8 | 4 | Aggregates | Properties of aggregates, Grading aggregates,  Shape and texture of aggregates, | Lecture and Lab | Written exam |
| 9 | 4 | Aggregates | Example Problems | Lecture and Lab | Written exam |
| 10 | 4 | Fresh concrete | workability of fresh concrete | Lecture and Lab | Written exam |
| 11 | 4 | Fresh concrete | Measurement of workability, Factors affecting workability | Lecture and Lab | Written exam |
| 12 | 4 | Fresh concrete | Segregation and bleeding, Slump loss | Lecture and Lab | Written exam |
| 13 | 4 | Fresh concrete | manufacture of concrete, delivery of concrete | Lecture and Lab | Written exam |
| 14 | 4 | Fresh concrete | concrete placing | Lecture and Lab | Written exam |
| 15 | 4 | Fresh concrete | concrete placing | Lecture and Lab | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Advanced concrete technology by Zongjin Li.  2. Concrete technology by Dr. Moaid Nory |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | 1. Concrete Technology -2dn Ed by A.M. NEVILLE |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | computer programming |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Familiarity with the programming language Fortran and the implementation of engineering applications using the programming language. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Learn about the programming language Fortran.  A2- Learn how to write a program in Fortran.  A3- Implementation of several engineering programs using the programming language Fortran.  A4- Identify the variables and constants in the programming language. Identify loops, arrays, and subprograms. |
| B. Subject-specific skills  B1- Writing an engineering program in Fortran.  B2- Convert any problem to a program written in Fortran.  B3- Reserving locations for engineering data in the program's memory and using them.  B4- Linking information to engineering reality. |
| Teaching and Learning Methods |
| • Weekly homework and daily and weekly quizzes. Giving assignments and activities in the classroom. As well as guiding students to the important scientific sources and taking some exercises to practice on them. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | Program, write | Introduction | Lecture | Written exam |
| 2 | 2 | Constant and variables | Constant and variables | Lecture | Written exam |
| 3 | 2 | Inputs and outputs | Inputs and outputs | Lecture | Written exam |
| 4 | 2 | GOTO FORMAT | FORMAT | Lecture | Written exam |
| 5 | 2 | Control statements | Control statements | Lecture | Written exam |
| 6 | 2 | Loop | DO loop | Lecture | Written exam |
| 7 | 2 | IF statement | IF types | Lecture | Written exam |
| 8 | 2 | DO And IF | DO And IF | Lecture | Written exam |
| 9 | 2 | More examples | examples | Lecture | Written exam |
| 10 | 2 | remarks | Remarks | Lecture | Written exam |
| 11 | 2 | Array statement | Types of Array statement | Lecture | Written exam |
| 12 | 2 | DIMENSION | DIMENSION | Lecture | Written exam |
| 13 | 2 | Read and write | Read and write | Lecture | Written exam |
| 14 | 2 | Where statement | Where statement | Lecture | Written exam |
| 15 | 2 | Sub Routines | Sub Routines | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Fortran Language programming |
| 2. Key references (sources) | Lectures on Fortran Language |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites |  |

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| 12. Course development plan |
| Working on raising the student’s skill in helping to quickly integrate into society and refining their skills in line with the needs of scientific research and the labor market. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Definition of human rights and the democratic system and intellectual positions on them with an explanation of the different models of them and the relationship of civil society with them. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Human rights and democracy |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1nt semester / 1rt year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Introducing the student to human rights and its relationship to the democratic system and clarifying its characteristics. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Historical introduction to democracy.  A2- The different models of democracy  A3- Rights and Responsibilities  A4- civil liberties. |
| B. Subject-specific skills  B1 - Apply quantitative methods for the purpose of explaining and interpreting the idea of rights and democracy.  B2 - Use Using basic knowledge to examine the historical development of the concept of freedom.  B3 - Evaluate the information needed to understand different opinions on a common topic. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | A historical introduction to democracy | Democracy | Lecture | Written exam |
| 2 | 2 | The different models of democracy | Democracy | Lecture | Written exam |
| 3 | 2 | Intellectual positions on democracy | Democracy | Lecture | Written exam |
| 4 | 2 | Islam and democracy | Democracy | Lecture | Written exam |
| 5 | 2 | Parliament | Democracy | Lecture | Written exam |
| 6 | 2 | basic components of democracy | Democracy | Lecture | Written exam |
| 7 | 2 | Civil society | Democracy | Lecture | Written exam |
| 8 | 2 | The historical development of human rights | human rights | Lecture | Written exam |
| 9 | 2 | Rights and Responsibilities | human rights | Lecture | Written exam |
| 10 | 2 | Equality and the law | human rights | Lecture | Written exam |
| 11 | 2 | the Constitution | human rights | Lecture | Written exam |
| 12 | 2 | Inalienable rights | human rights | Lecture | Written exam |
| 13 | 2 | Citizenship concept | human rights | Lecture | Written exam |
| 14 | 2 | Majority rule and minority rights | human rights | Lecture | Written exam |
| 15 | 2 | Judicial procedures | human rights | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Human rights, children and democracy About the Ministry of Higher Education and Scientific Research - University of Tikrit |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Applied Mathematics 2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present partial differentiation and multiple integrals and their applications in engineering as well as introduction to complex numbers | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Study partial derivatives and their applications.  A2- Study multiple integrals and their applications in engineering. |
| B. Subject-specific skills  B1- study partial derivatives for the functions of two or multiple variables, chain rules, directional derivatives, and critical points.  B2 - Study the multiple integrals in Cartesian and polar coordinates and area, volume, centroid and moment of inertia calculations using multiple integrals. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Partial Derivatives | Functions of Several Variables, Domains and Ranges | Lecture | Written exam |
| 2 | 4 | Limits and Continuity in Higher Dimensions | Limits for Functions of Two Variables | Lecture | Written exam |
| 3 | 4 | Partial Derivatives | Partial Derivatives of a Function of Two and Three Variables Second-Order and higher Partial Derivatives | Lecture | Written exam |
| 4 | 4 | The Chain Rule | The Chain Rule and Implicit Differentiation | Lecture | Written exam |
| 5 | 4 | Directional Derivatives and Gradient Vectors | Directional Derivatives and Gradient Vectors | Lecture | Written exam |
| 6 | 4 | Tangent Planes and Differentials | Tangent Planes and Normal Lines | Lecture | Written exam |
| 7 | 4 | Estimating Change in a Specific Direction | Estimating Change in a Specific Direction | Lecture | Written exam |
| 8 | 4 | Extreme Values and Saddle Points | Extreme Values and Saddle Points | Lecture | Written exam |
| 9 | 4 | Multiple Integrals | Double and triple Integrals | Lecture | Written exam |
| 10 | 4 | Area by Double Integration | Area by Double Integration | Lecture | Written exam |
| 11 | 4 | Double Integrals in Polar Form | Double Integrals in Polar Form, Changing Cartesian Integrals into Polar Integrals | Lecture | Written exam |
| 12 | 4 | Applications | Area, volume, centroid and moment of inertia | Lecture | Written exam |
| 13 | 4 | Triple Integrals in Cylindrical and Spherical Coordinates | Triple Integrals in Cylindrical and Spherical Coordinates | Lecture | Written exam |
| 14 | 4 | Complex Numbers | Complex Numbers, Argand Diagrams, Euler’s Formula | Lecture | Written exam |
| 15 | 4 | Operations on complex number | Addition, subtraction, multiplication and division | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Thomas’ Calculus, George B. Thomas, Jr. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Mechanics of Materials -II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to introduce the principles of analyzing beams and calculating stresses in them, as well as thin columns. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Calculation of shear forces and bending moments of beams.  A2 Calculation of stresses in beams.  A3- Calculation of deformations in the beams.  A4- Analyzing slender columns. |
| B. Subject-specific skills  B1- Applying analytical and numerical methods for the purpose of solving mechanics of materials problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to Beam Analysis | Beams | Lecture | Written exam |
| 2 | 4 | Determination of Shear Force | Shear forces | Lecture | Written exam |
| 3 | 4 | Determination of Shear Force | Shear forces | Lecture | Written exam |
| 4 | 4 | Determination of Shear Force | Shear forces | Lecture | Written exam |
| 5 | 4 | Determination of Bending Moments | Bending Moment | Lecture | Written exam |
| 6 | 4 | Determination of Bending Moments | Bending Moment | Lecture | Written exam |
| 7 | 4 | Determination of Bending Moments | Bending Moment | Lecture | Written exam |
| 8 | 4 | Flexural Formula and Bending Stress | Bending Stresses | Lecture | Written exam |
| 9 | 4 | Flexural Formula and Bending Stress | Bending Stresses | Lecture | Written exam |
| 10 | 4 | Introduction to Shear Stress in Beams | Shear Stresses | Lecture | Written exam |
| 11 | 4 | Introduction to Shear Stress in Beams | Shear Stresses | Lecture | Written exam |
| 12 | 4 | Introduction to Shear Stress in Beams | Shear Stresses | Lecture | Written exam |
| 13 | 4 | Introduction to Beam Deflection | Deflection of Beams | Lecture | Written exam |
| 14 | 4 | Introduction to Beam Deflection | Deflection of Beams | Lecture | Written exam |
| 15 | 4 | Introduction to Column Buckling | Column Buckling | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1.Strength of Materials.  2. Mechanics of Materials , R.C. Hibbeler. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Adding practical laboratory hours to conduct mechanics of material experiments |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Fluid Mechanics - 2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 2nd year |
| 6. Number of hours tuition (total) | 45 theoretical hours and 30 practical hours |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims for studying the basic methods to understand the fluid in motion and measure the flow rates of water. Knowing the major and minor losses due to frictions and methods of pipes connections. In addition, knowing how to find the flow rates of water and pressures through pipes networks. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1-Methods for measuring the flow rates through pipelines, tanks, and open channel.  A2- Methods for identifying the types of flow regimes.  A3-Methods for calculating the major and minor losses in pipelines due to friction.  A4- Methods for calculating the equivalent pipe and series and parallel pipelines connections. Methods for calculating flow rates in branching pies and pipes networks. Studying flow through open channels and how to find the best hydraulic sections, and critical depth. |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for solving fluid mechanics problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Fluid Dynamics | Application of continuity equation | Lecture | Written exam |
| 2 | 3 | Fluid Dynamics | Application of energy equation | Lecture | Written exam |
| 3 | 3 | Fluid Dynamics | Energy line and hydraulic grade line | Lecture | Written exam |
| 4 | 3 | Fluid Dynamics | Energy line and hydraulic grade line | Lecture | Written exam |
| 5 | 3 | Measurements of flow rate | Measurements of flow in pipelines | Lecture | Written exam |
| 6 | 3 | Measurements of flow rate | Measurements of flow in tanks | Lecture | Written exam |
| 7 | 3 | Measurements of flow rate | Measurements of flow in open channels | Lecture | Written exam |
| 8 | 3 | Flow in pipes | Laminar & Turbulent flows, Reynolds No. | Lecture | Written exam |
| 9 | 3 | Flow in pipes | Major losses | Lecture | Written exam |
| 10 | 3 | Flow in pipes | Minor losses , Equivalent pipe | Lecture | Written exam |
| 11 | 3 | Flow in pipes | Parallel pipes, series pipes | Lecture | Written exam |
| 12 | 3 | Flow in pipes | Branching pipes | Lecture | Written exam |
| 13 | 3 | Flow in pipes | Pipe networks | Lecture | Written exam |
| 14 | 3 | Flow in open channels | Types of flow, Best hydraulic section | Lecture | Written exam |
| 15 | 3 | Flow in open channels | Specific energy and critical depth | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1.Fluid Mechanics by Streeter &Wylie  2. ميكانيك الموائع د . نزار السبتي. |
| 2. Key references (sources) | 1- Fluid Mechanics for Engineer by Albertson, Barton &Simons  2- Fluid Mechanics & Hydraulics (Schaums series) by Giles |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | - Reputable websites.  - Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Surveying II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Qualifying the students of the second stage to be a scientific base that helps the student to carry out cadastral applications through how to establish vertical horizontal control networks, ground control points, geodesic coordinate systems, and convert topographic coordinates to geodesic | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Application of area measurement methods  A2- Apply the horizontal curve measurement method.  A3- Apply the vertical curve measurement method.  A4- Application of volume measurement methods. Introduction to geographic information systems. |
| B. Subject-specific skills  B1 - the work of surveying projects.  B2 - Making networks of curves.  B3 - Calculation of cadastral quantities and volumes. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. And through lecture, workshop, laboratory, field training, summer training. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 5 | Application of Areas | Area Calculation | Lecture and Lab | Quizzes and mid term exams |
| 2 | 5 | Application of Areas | Area Calculation | Lecture and Lab | Quizzes and mid term exams |
| 3 | 5 | Application of Areas | Area Calculation | Lecture and Lab | Quizzes and mid term exams |
| 4 | 5 | Application of Areas | Area Calculation | Lecture and Lab | Quizzes and mid term exams |
| 5 | 5 | Applications to Curvatures | Vertical Curve | Lecture and Lab | Quizzes and mid term exams |
| 6 | 5 | Applications to Curvatures | Vertical Curve | Lecture and Lab | Quizzes and mid term exams |
| 7 | 5 | Applications to Curvatures | Vertical Curve | Lecture and Lab | Quizzes and mid term exams |
| 8 | 5 | Applications to Curvatures | Horizontal Curve | Lecture and Lab | Quizzes and mid term exams |
| 9 | 5 | Applications to Curvatures | Horizontal Curve | Lecture and Lab | Quizzes and mid term exams |
| 10 | 5 | Applications to Curvatures | Horizontal Curve | Lecture and Lab | Quizzes and mid term exams |
| 11 | 5 | Application of volumes | Volume calculation | Lecture and Lab | Quizzes and mid term exams |
| 12 | 5 | Application of volumes | Volume calculation | Lecture and Lab | Quizzes and mid term exams |
| 13 | 5 | Application of volumes | Volume calculation | Lecture and Lab | Quizzes and mid term exams |
| 14 | 5 | Application of GIS | GIS | Lecture and Lab | Quizzes and mid term exams |
| 15 | 5 | Application of GIS | GIS | Lecture and Lab | Quizzes and mid term exams |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Surveying applications by Yaseen Obead |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Include GIS and remote sensing in lectures |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Concrete Technology |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the fundamentals of concrete technology with special focus on cement, aggregate and concrete properties including the process of manufacturing of cement planning stage. This is to pave the way for student to learn more aspect about concrete technology in the second semester. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Concrete Mix design  A2- durability of concrete.  A3- deformation of concrete  A4 – Non-destructive tests |
| B. Subject-specific skills  B1 – learning to design concrete mix using the American and British methods |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Concrete Mix Design | American Method | Lecture and Lab | Written exam |
| 2 | 4 | Concrete Mix Design | American Method | Lecture and Lab | Written exam |
| 3 | 4 | Concrete Mix Design | American Method | Lecture and Lab | Written exam |
| 4 | 4 | Concrete Mix Design | American Method | Lecture and Lab | Written exam |
| 5 | 4 | Concrete Mix Design | British Method | Lecture and Lab | Written exam |
| 6 | 4 | Concrete Mix Design | British Method | Lecture and Lab | Written exam |
| 7 | 4 | Concrete Mix Design | British Method | Lecture and Lab | Written exam |
| 8 | 4 | Concrete Mix Design | British Method | Lecture and Lab | Written exam |
| 9 | 4 | Concrete Mix Design | Calculation of Concrete raw material quantities | Lecture and Lab | Written exam |
| 10 | 4 | Deformation of Concrete | Dimensional  Stability Shrinkage and Creep | Lecture and Lab | Written exam |
| 11 | 4 | Deformation of Concrete | Dimensional  Stability Shrinkage and Creep | Lecture and Lab | Written exam |
| 12 | 4 | Durability of Concrete | Durability | Lecture and Lab | Written exam |
| 13 | 4 | Durability of Concrete | Durability | Lecture and Lab | Written exam |
| 14 | 4 | Non-Destructive Tests | Schmidt Hammer | Lecture and Lab | Written exam |
| 15 | 4 | Non-Destructive Tests | Ultrasonic testing | Lecture and Lab | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Advanced concrete technology by Zongjin Li.  2. Concrete technology by Dr. Moaid Nory |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | 1. Concrete Technology -2dn Ed by A.M. NEVILLE |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | ENGINEERING STATISTICS |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 2nd year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic of engineering statistics by analyzing, organizing and describing data in tables and drawings, knowing the measures of dispersion and central tendency, in addition to knowing the theory of probability and inference from the data to make decisions and linking them to engineering reality. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Understand the importance of statistics and its divisions.  A2- Learn how to show and represent statistical data with tables or graphics.  A3- Identify the most important measures of central tendency and dispersion of data.  A4- Learn about probability theory and its different distributions. Identifying the design of samples, their estimation, and knowledge of their properties. |
| B. Subject-specific skills  1- Analyze, organize, and describe data in tables and/or curves.  2- Describe the averages of the data and methods of measuring their dispersion.  3- Engineering inference from the statistical data to take the appropriate decision.  4- Linking information to engineering reality. |
| Teaching and Learning Methods |
| • Weekly homework and daily and weekly quizzes. Giving assignments and activities in the classroom. As well as guiding students to the important scientific sources and taking some exercises to practice on them. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | brief definition in statistics | INTRODUCTION TO ENGINEERING STATISTICS | Lecture | Written exam |
| 2 | 2 | Frequency distributions, Frequency distributions table | PRESENTATION OF STATISTICS DATA cont. | Lecture | Written exam |
| 3 | 2 | Cumulative frequency distribution, Graphical representation of data | PRESENTATION OF STATISTICS DATA | Lecture | Written exam |
| 4 | 2 | Cumulative frequency curves, Histogram, Frequency polygon | Graphical representation of data | Lecture | Written exam |
| 5 | 2 | Measures of center, four types | MEASURES OF CENTRAL LOCATION | Lecture | Written exam |
| 6 | 2 | Measures of dispersion, four types, Probability theory | MEASURES OF DISPERSION, THE PROBABILITY | Lecture | Written exam |
| 7 | 2 | Combinations of Three or More Events | THE PROBABILITY cont. | Lecture | Written exam |
| 8 | 2 | Probability theory rules, Conditional Probability, Bayes’ theorems | THE PROBABILITY cont. | Lecture | Written exam |
| 9 | 2 | Geometric Probability examples, | Geometric Probability, | Lecture | Written exam |
| 10 | 2 | Discrete probability distribution, Discrete Uniform Distribution | PROBABILITY DISTRIBUTION, | Lecture | Written exam |
| 11 | 2 | Geometric Distribution, Negative binomial Distribution, Binomial Distribution | PROBABILITY DISTRIBUTION, cont. | Lecture | Written exam |
| 12 | 2 | Continuous Probability Distributions, Continuous Uniform Distributions, Normal Distributions, Exponential Distributions , | Continuous Probability Distributions | Lecture | Written exam |
| 13 | 2 | Sampling Distribution of the Sample Mean, Central Limit Theorem, applications | SAMPLING DISTRIBUTION | Lecture | Written exam |
| 14 | 2 | Expectation properties, Moments | THE EXPECTATION | Lecture | Written exam |
| 15 | 2 | point estimator, interval estimator | THE ESTIMATION | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Statistics with engineering applications  Entry to statistics |
| 2. Key references (sources) | Lectures on Statistics |
| A- Recommended books and references (scientific journals, reports ,.... | Fundamentals of Behavioral Statistics ,1988 |
| B- Electronic references, websites |  |

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| 12. Course development plan |
| Working on raising the student’s skill in helping to quickly integrate into society and refining their skills in line with the needs of scientific research and the labor market. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Building Construction |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 2nd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to provide the student by the information about the details and steps of implementation of projects. such as, earthworks, foundations, piles, masonry construction, and finishing. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Study the steps of implementing construction projects  A2- Studying the details and requirements for the implementation of excavation works, foundations, walls and ceilings  A3- Knowing how to choose the appropriate construction equipment for each job  A4- Design of brick walls |
| B. Subject-specific skills  B1 - Knowing the details of earthworks  B2 - Knowing the details of the foundations and pile works  B3 - Knowing the details of brickwork  B4- Application of brick wall design |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Steps to start an engineering project | Introduction to building construction | Lecture | Written exam |
| 2 | 4 | Earthworks details and requirements | Earthworks | Lecture | Written exam |
| 3 | 4 | Excavation basing details | Excavation side shoring | Lecture | Written exam |
| 4 | 4 | Methods and techniques for withdrawing water from work sites | Water drainage methods | Lecture | Written exam |
| 5 | 4 | Shallow foundation works details and requirements | Shallow foundation works | Lecture | Written exam |
| 6 | 4 | Pile details and requirements | Pile works | Lecture | Written exam |
| 7 | 4 | Concrete work requirements | Concrete works | Lecture | Written exam |
| 8 | 4 | Brick construction details | Brick work | Lecture | Written exam |
| 9 | 4 | Brick wall design steps | Structural design of brick walls | Lecture | Written exam |
| 10 | 4 | Non-structural requirements for wall works | Requirements for walls | Lecture | Written exam |
| 11 | 4 | Details and types of joints | Joint work | Lecture | Written exam |
| 12 | 4 | Types of beams, ceilings and floors and the loads on them | Works of beams, ceilings and floors | Lecture | Written exam |
| 13 | 4 | Details of water proofing layers | Moisture insulation | Lecture | Written exam |
| 14 | 4 | Details and types of stairs and | Means of transition between levels | Lecture | Written exam |
| 15 | 4 | Types and materials of finishes | Finishing work | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Building Construction, Z. Sako and A. Levon |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | **Edward Allen and Joseph Iano “Fundamentals of Building Construction”** |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Introducing advanced mathematical solutions that face the student when studying various engineering topics and engineering analysis methods. It includes the definition of ordinary differential equations of the first and higher order, partial differential equations, how to solve them, their various geometric applications, and the definition of Fourier series and its applications. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Analysis |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 3rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| Recognize the following vocabulary:  1- Ordinary differential equations of the first degree.  2- Engineering applications of first-order differential equations.  3- The set of simultaneous ordinary differential equations.  4- Ordinary differential equations of the second degree and higher with fixed and variable coefficients.  5- Fourier series.  6- Partial differential equations. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Preparing applied engineers in the field of civil engineering who are distinguished by a high level of knowledge and analytical creativity in line with the internationally approved standards in quality assurance and academic accreditation for the corresponding engineering programs, while adhering to the ethics of the engineering profession.  A2- Enabling knowledge and understanding of practical applications in numerical ways and in accordance with the objectives of the course.  A3- The ability to identify different numerical methods.  A4- The ability to build a mathematical model to represent various engineering processes. |
| B. Subject-specific skills  B1 - The ability to analyze and discuss.  B2 - Brainstorming by encouraging students to produce a large number of ideas about an issue or problem that is raised during the lecture.  B3 - Cooperative learning by working collectively.  B4 - Competitive learning by creating an atmosphere of competition between peers. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Knowing the types and classifications of equations  Ordinary differential and types of solutions | Introduction to differential equations | Theoretical | Questions, discussion and quiz |
| 2 | 4 | Knowing equations with separable variables and homogeneous equations | First order ordinary differential equations-1 | Theoretical | Questions, discussion and quiz |
| 3 | 4 | Knowing exact equations | First order ordinary differential equations-2 | Theoretical | Questions, discussion and quiz |
| 4 | 4 | Knowing linear equations and Bernoulli equations | First order ordinary differential equations-3 | Theoretical | Questions, discussion and quiz |
| 5 | 4 | Orthogonal trajectories and suspended cables application | Applications on 1st order ordinary differential equations-1 | Theoretical | Questions, discussion and quiz |
| 6 | 4 | Flow through orifices, moving bodies and general applications | Applications on 1st order ordinary differential equations-2 | Theoretical | Questions, discussion and quiz |
| 7 | 4 | Knowing homogeneous linear equations with constant coefficients | Second and higher order linear ordinary differential equations-1 | Theoretical | Questions, discussion and quiz |
| 8 | 4 | Knowing linear nonhomogeneous equations with constant coefficients | Second and higher order linear ordinary differential equations-2 | Theoretical | Questions, discussion and quiz |
| 9 | 4 | Knowing linear equations with variable coefficients | Second and higher order linear ordinary differential equations-3 | Theoretical | Questions, discussion and quiz |
| 10 | 4 | Deflection of beams and buckling of columns applications | Applications on 2nd and higher order ordinary differential equations-1 | Theoretical | Questions, discussion and quiz |
| 11 | 4 | Deflection of beam-columns application | Applications on 2nd and higher order ordinary differential equations-2 | Theoretical | Questions, discussion and quiz |
| 12 | 4 | Vibration application | Applications on 2nd and higher order ordinary differential equations-3 | Theoretical | Questions, discussion and quiz |
| 13 | 4 | Knowing the Fourier series | Fourier series | Theoretical | Questions, discussion and quiz |
| 14 | 4 | Knowing the types and solutions of partial differential equations | Partial differential equations | Theoretical | Questions, discussion and quiz |
| 15 | 4 | Learn and solve matrices and determinants in different ways | Matrices and determinants | Theoretical | Questions, discussion and quiz |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) | ERWIN KREYSZIG, ADVANCED  ENGINEERING  MATHEMATICS, NINTH EDITION, JOHN WILEY & SONS, INC., 2006. |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Follow the vocabulary of similar courses in prestigious international universities |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if he takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Theory of structures 1 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 3rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic methods of analyzing statically defined structures as an introduction to the analysis of undefined structures and structural design decisions. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Classification of facilities and a review of the concept of equilibrium of facilities under the influence of forces.  A2- Analyzing the internal forces and moments generated in lintels and flat structures under the influence of systems of forces and moments. Analysis of forces in the dentate members.  AA3- Drawing influence diagrams for the lintels and struts and calculating the maximum values of internal reactions as a result of moving loads.  AA4- Learn approximate methods of analysis of existing structures and trusses. Apply the engineering methods used in calculating the slopes and deviations of the statically defined beams. |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving structural engineering problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Classification of structures and review of eqilibrium | Introduction | Lecture | Written exam |
| 2 | 4 | Review of bending moment and shear force diagrams in beams | Internal  loading developed in structural members | Lecture | Written exam |
| 3 | 4 | Bending moment and shear force diagrams in frames | Internal loading developed in structural members | Lecture | Written exam |
| 4 | 4 | Bending moment and shear force diagrams in frames | Internal loading developed in structural members | Lecture | Written exam |
| 5 | 4 | Review of truss analysis | Analysis of statically determinate trusses | Lecture | Written exam |
| 6 | 4 | Introduction to concept of influence lines | Influence lines for statically determinate structures | Lecture | Written exam |
| 7 | 4 | Applications on influence lines for beams | Influence lines for statically determinate structures | Lecture | Written exam |
| 8 | 4 | Applications on influence lines for trusses | Influence lines for statically determinate structures | Lecture | Written exam |
| 9 | 4 | Applications on influence lines for trusses | Influence lines for statically determinate structures | Lecture | Written exam |
| 10 | 4 | Determination of maximum reaction for series of moving loads | Influence lines for statically determinate structures | Lecture | Written exam |
| 11 | 4 | Approximate method for truss analysis | Approximate methods of analysis of structures | Lecture | Written exam |
| 12 | 4 | Portal method | Approximate methods of analysis of structures | Lecture | Written exam |
| 13 | 4 | Double-integration method | Deflections | Lecture | Written exam |
| 14 | 4 | Singularity function method | Deflections | Lecture | Written exam |
| 15 | 4 | Moment-area method | Deflections | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Elementary Theory of Structures, Yan-Yu Hseih, Prentice Hall.  2. Structural Analysis, R.C. Hibbeler, Prentice Hall. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | Steelwork design guide to BS 5950-1 |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Soil Mechanics II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 45 hrs theoretical + 30 hrs practical |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to calculate the stresses generated in the soil and the long-term settlement resulting from these stresses. Also, evaluating the resistance of soil to shear stresses as well as normal and lateral loads. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Identifying the types of stresses in saturated soils.  A2- Studying the consolidation settlement of soils.  A3- Identify the methods used to find the shear strength of soils.  A4- Identifying the methods used for calculating the lateral earth pressure. |
| B. Subject-specific skills  B1 - Learning how to calculate stresses generated in the soil.  B2 - Studying the consolidation theory and methods used to calculate long-term settlement.  B3 - Derivation of equations used to find soil shear strength.  B4 - Derivation of equations used to assess the lateral earth pressure on the retaining structures. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. All lectures have been presented electronically and uploaded on social media platforms to be accessible to students when needed. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Introduction soil formation | Basic Characteristics of Soils | Lecture | Written exam |
| 2 | 3 | Derivation of Weight-Volume Relationships | Weight-Volume Relationships | Lecture | Written exam |
| 3 | 3 | Application of Weight-Volume Relationships | Weight-Volume Relationships | Lecture | Written exam |
| 4 | 3 | Introduction to Plasticity and Structure of Soil | Plasticity and Structure of Soil | Lecture | Written exam |
| 5 | 3 | Methods used to find Plasticity characteristics of soil | Plasticity and Structure of Soil | Lecture | Written exam |
| 6 | 3 | Methods used for the mechanical analysis of soil | Classification of Soil | Lecture | Written exam |
| 7 | 3 | Application to the modified soil classification system | Classification of Soil | Lecture | Written exam |
| 8 | 3 | General principles of Compaction | Soil Compaction | Lecture | Written exam |
| 9 | 3 | Determination of field unit weight and equipments used for compaction | Soil Compaction | Lecture | Written exam |
| 10 | 3 | Hydraulic conductivity | Permeability | Lecture | Written exam |
| 11 | 3 | Methods used to determine Hydraulic conductivity | Permeability | Lecture | Written exam |
| 12 | 3 | Flow of water in soil | Permeability | Lecture | Written exam |
| 13 | 3 | Flow nets | Seepage | Lecture | Written exam |
| 14 | 3 | Application of Flow nets | Seepage | Lecture | Written exam |
| 15 | 3 | Seepage through an Earth Dam | Seepage | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | - Principles of Geotechnical Engineering (By: Braja M. Das, 7th Ed.) |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | -Soil Mechanics (By: R.F. Craig, 4th Ed. or higher)  -Soil Mechanics (By: T.W. Lambe and R.V. Whitman) |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides the basic description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Reinforced concrete Design I |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1nd semester / 3rd year |
| 6. Number of hours tuition (total) | 75 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic methods of analysis and design of reinforced concrete structure including the an introduction to the materials which produce the concrete and the materials tests in laboratory | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Application of the analysis method of reinforced concrete structures including rectangular beam, T beams and special shape beams structural  A2- Application of analysis and design the beams for shear.  A3- Analysis and design of one-way slab using ACI coefficient method in analysis |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving problems  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and Design problems solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 5 | Mixing, Placing, Compacting and Curing of concrete | Introduction | Lecture | Written exam |
| 2 | 5 | Concrete Behavior in Compression and Tension. And Quality Control | Introduction | Lecture | Written exam |
| 3 | 5 | Reinforcing Steel for Concrete. And | Introduction | Lecture | Written exam |
| 4 | 5 | Design Codes and Specifications.  Loads and Safety Provisions. | Introduction | Lecture | Written exam |
| 5 | 5 | Behavior of R.C beam under loading and working stress method: | Working Stress Method | Lecture | Written exam |
| 6 | 5 | Introduction to Working Stress Method. And applications of the Working Stress Method. | Working Stress Method | Lecture | Written exam |
| 7 | 5 | Introduction and Behavior of Reinforced Concrete Beam under Bending. | Flexural Beam Analysis And Design | Lecture | Written exam |
| 8 | 5 | Design of Tension Reinforced Rectangular Beams. | Flexural Beam Analysis And Design | Lecture | Written exam |
| 9 | 5 | Practical Consideration in the Design of Beams. | Flexural Beam Analysis And Design | Lecture | Written exam |
| 10 | 5 | Rectangular Sections With Tension and Compression Reinforcement. | Flexural Beam Analysis And Design | Lecture | Written exam |
| 11 | 5 | Flexural Analysis and Design of T-beams. | Flexural Analysis and Design of T-beams. | Lecture | Written exam |
| 12 | 5 | Shear and Diagonal Tension in Beams. | Shear and Diagonal Tension in Beams. | Lecture | Written exam |
| 13 | 5 | Shear Strength of Concrete without Reinforcement. And Reinforced Concrete Beams With Web Reinforcements. | Shear and Diagonal Tension in Beams. | Lecture | Written exam |
| 14 | 5 | Types of Slabs. And Analysis and Design of One-Way Slab. | Design and Analysis of Slabs. | Lecture | Written exam |
| 15 | 5 | Temperature and Shrinkage Reinforcement. | Design and Analysis of Slabs. | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | 1- Structural Concrete Theory and Design , By Nadim Hasson, Akthem Aktham Al manseer , 6th Edition 2015  2- Reinforced concrete design , 7th Edition 2007 By Chu Kai Wang, Charles G salmon and Joe A Pincheire  3- Design of Reinforced concrete Structures , 2nd Edition 2008 By Mohammed Tharwat Ghonein, Vol. 3  4- Design of concrete Structure , 14th Edition 2010 By Arthur H. Nilson , Daved Derwin and Charles W . Dolan  5- Reinforced concrete design , 6th Edition 2009 By Edward G. Nawy  6- ACI Code 318- 2019 |
| B- Electronic references, websites |  |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides the possibility of designing different irrigation systems and providing accurate details about the plant’s need for water consumption, the method of infiltration and how to calculate it, in addition to calculating the consistency coefficient of irrigation, efficiency and adequacy, as well as designs for land grading, concepts of surface irrigation and methods of surface irrigation design, as well as designs for modern methods such as sprinkler and drip. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Irrigation Engineering |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 3rd year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of irrigation engineering systems and their applications in agricultural fields.  A2- Gaining the ability to address water wastage problems through the design of irrigation systems.  A3- Acquisition of basic skills in the management of irrigation systems.  A4- Gaining experience in designing the irrigation system and its suitability according to the different surrounding conditions. Gaining experience in knowing the difference between the old and modern irrigation system. Optimum management of the irrigation system. |
| B. Subject-specific skills  B1 - The ability to design irrigation systems in their various ways.  B2 - The ability to think about addressing the problems of water wastage and find ways to reduce it.  B3 - Writing scientific reports and reading charts and tables. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Irrigation, benefits of irrigation, irrigation networks | Introduction | theoretical | questions and discussion |
| 2 | 3 | Types of irrigation methods, evaluating irrigation water sources | Introduction | theoretical | questions and discussion |
| 3 | 3 | Calculation of the volume of water in the soil, methods of calculating water consumption | Introduction | theoretical | questions and discussion |
| 4 | 3 | Efficiency, adequacy and uniformity of irrigation | Introduction | theoretical | questions and discussion |
| 5 | 3 | Methods of Land grading design | Land grading design | theoretical | questions and discussion |
| 6 | 3 | Surface irrigation process mechanism, water balance concept | surface irrigation | theoretical | questions and discussion |
| 7 | 3 | Design assumptions, design flow rate, border length and width | Border irrigation |  |  |
| 8 | 3 | Furrow intake characteristics, Two-point method | Furrow irrigation | theoretical | questions and discussion |
| 9 | 3 | Design Equations, Design limitations | Basin irrigation | theoretical | questions and discussion |
| 10 | 3 | Layout of stationary system, the effect of wind direction | Sprinkler irrigation | theoretical | questions and discussion |
| 11 | 3 | Fundamentals of flow hydraulics | Sprinkler irrigation | theoretical | questions and discussion |
| 12 | 3 | Flow in multi-outlet pipes | Sprinkler irrigation | theoretical | questions and discussion |
| 13 | 3 | Design of sprinkler system | Sprinkler irrigation | theoretical | questions and discussion |
| 14 | 3 | Benefits of drip irrigation, the basic components of the drip system | Drip irrigation | theoretical | questions and discussion |
| 15 | 3 | Design of drip system | Trickle irrigation | theoretical | questions and discussion |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Field Irrigation Systems Engineering |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Management |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 3rd year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the fundamentals of project management with special focus on planning stage. This is to pave the way for student to learn more aspect about project management in the second semester. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Introduction to project management, the need for project management in the construction industry, Organizational influences and Project life Cycle, Project management processes and Integration Management.  A2- Scope, time and cost management.  A3- Resource and Quality Management |
| B. Subject-specific skills  B1 - Plan Schedule Management, Define and sequence Activities, Estimate Activity Resources and Duration and Level resources  B2 – Application of key project planning and scheduling techniques including CPM, PERT and LOB. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | Introduction to project management | Introduction to project management | Lecture | Written exam |
| 2 | 2 | Project scope management | Collect requirement, Define Scope, Create WBS, Validate Scope and Control Scope | Lecture | Written exam |
| 3 | 2 | Project Time management | Define and sequence Activities, | Lecture | Written exam |
| 4 | 2 | Project Time management | Estimate Activity Resources and Duration | Lecture | Written exam |
| 5 | 2 | Project Time management | Bar Chart Method | Lecture | Written exam |
| 6 | 2 | Project Time management | AOA Method | Lecture | Written exam |
| 7 | 2 | Project Time management | AON Methods | Lecture | Written exam |
| 8 | 2 | Project Time management | CPM Calculation | Lecture | Written exam |
| 9 | 2 | Project Time management | PERT Method | Lecture | Written exam |
| 10 | 2 | Project Time management | LOB method | Lecture | Written exam |
| 11 | 2 | Project Time management | LOB method | Lecture | Written exam |
| 12 | 2 | Resource Management | Resource Smoothing Method | Lecture | Written exam |
| 13 | 2 | Resource Management | Resource Levelling Method | Lecture | Written exam |
| 14 | 2 | Project Quality Management | Plan Quality, Perform Quality Assurance and Control Quality | Lecture | Written exam |
| 15 | 2 | Communication Management | Plan, Manage and Control Communications | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. A Guide to the project management body of knowledge - PMI.  2. إدارة المشاريع الإنشائية والعلاقات المهنية: احسان العطار |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | 1. Project Management, A Systems Approach to Planning, Scheduling, and Controlling, 10th edition, KERZNER  2. Principles of Construction management By: Roy Piltcher  3. Construction Planning, Programming and Control by Brian Cooke  4. Operations Management Creating Value Along the Supply Chain Russell - Chapter 9: Project management |
| B- Electronic references, websites | Reputable websites. Such as PMI.org or apm.org.uk  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATEFORCOURSESPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Traffic Engineering is that phase of engineering which deals with the planning, geometric design and traffic operations of roads, streets, and highways, their networks, terminals, abutting lands and relationships with other modes of transportation for the achievement of safe, efficient, and convenient movement of persons and goods.  . |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Traffic engineering |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1nd semester / 3rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic methods of study the traffic stream **parameters** such as speed ,volume ,density ,act .also study relationship among parameters | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge ,Understanding,teaching  A1- Traffic Counting methods  A2- speed counting methods.  A3- roadway design  A4- traffic control design and accident analyses.  . |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving traffic engineering problems.  B2 - Use basic knowledge to research new technologies.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction t | Introduction of Traffic engineering | Lecture | Written exam |
| 2 | 4 | The methods of volume counting | Volume subdues | Lecture | Written exam |
| 3 | 4 | The methods of speed counting | Speed studies | Lecture | Written exam |
| 4 | 4 | The method of capacity design of the roadway | Relation ship among speed, volume and density | Lecture | Written exam |
| 5 | 4 | Introduction to intersections types | intersections | Lecture | Written exam |
| 6 | 4 | Introduction to intersection traffic control | Traffic control methods | Lecture | Written exam |
| 7 | 4 | Introduction to intersection traffic control | Sign and marking | Lecture | Written exam |
| 8 | 4 | The method of determine delay in traffic signalized | traffic signalized analysis | Lecture | Written exam |
| 9 | 4 | The method of traffic signalized design | traffic signalized design - Webster metod | Lecture | Written exam |
| 10 | 4 | Determine the Sight distance | Stoping Sight distance | Lecture | Written exam |
| 11 | 4 | Determine the Sight distance | Passing Sight distance | Lecture | Written exam |
| 12 | 4 | Curves design | Horizontal curve design | Lecture | Written exam |
| 13 | 4 | Curves design | Vertical curve design | Lecture | Written exam |
| 14 | 4 | The method of parking design | Parking study | Lecture | Written exam |
| 15 | 4 | Analysis of accident | Accident study | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. principles of the traffic engineering ,dr.lamia A.Ahmed 2. text book lab , traffic engineering ,dr.lamia A.Ahmed |
| 2.Key references (sources) |  |
| A-Recommended books and references (scientific journals, reports ,.... | High way capacity manual |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| The development plan can be summarized by the small projects in the roadway networks for each student |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Computer Applications |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 3rd year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to provide the student with the skills to use the available engineering software them in the analysis and design of engineering projects | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Learn about engineering programs and their types  A2- Knowing the sources of obtaining the programs  A3- Knowing the basics of engineering programs |
| B. Subject-specific skills  B1 - Learn to choose the right program  B2 - Knowing how to provide the information required to be fed to the program  B3 - Knowing how to open the program and enter information  B4- Learn to perform analysis and get results |

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| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
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| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | Learn about engineering programs | Introduction | Practical Lecture | Practical exam |
| 2 | 2 | EPANET basics | EPANET software | Practical Lecture | Practical exam |
| 3 | 2 | Learn to draw the components of the water network | Data entry | Practical Lecture | Practical exam |
| 4 | 2 | Specifying the levels of nodes, tanks and pipe diameters | Network component properties | Practical Lecture | Practical exam |
| 5 | 2 | Enter pump information | Pumps information | Practical Lecture | Practical exam |
| 6 | 2 | Perform network analysis | Water Network Analysis | Practical Lecture | Practical exam |
| 7 | 2 | How to view the results | Display results | Practical Lecture | Practical exam |
| 8 | 2 | How to enter input information that changes over time | Time Pattern | Practical Lecture | Practical exam |
| 9 | 2 | How to conduct the analysis and present the results | Analysis and review of results | Practical Lecture | Practical exam |
| 10 | 2 | Definition of MS-Project | Introduction to MS-Project | Practical Lecture | Practical exam |
| 11 | 2 | Learn to divide the project into sub-activities | Work Breakdown Structure | Practical Lecture | Practical exam |
| 12 | 2 | Learn to enter the names of the activity and the time for each one | Activities and duration | Practical Lecture | Practical exam |
| 13 | 2 | Learn how to connect activities with time relationships | Relationships between activities | Practical Lecture | Practical exam |
| 14 | 2 | Using the critical path method | Critical Path Method | Practical Lecture | Practical exam |
| 15 | 2 | Learn to enter and organize resources | Resources | Practical Lecture | Practical exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Manual of EPANET 2. Manual of MS-PROJECT |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Introducing the advanced mathematical solutions that the student faces when studying various engineering topics and numerical analysis methods. It includes solving algebraic equations by numerical and Taylor series, how to perform derivation and integration by numerical methods, solving differential equations by numerical methods, and finding the mathematical model for a set of points, interpolation and extrapolation. |

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| 1. Teaching Institution | Basrah University |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Numerical Analysis |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| Recognize the following vocabulary:  1- Numerical solution to algebraic equations.  2- Taylor series.  3- Derivation and integration by numerical methods.  4- Numerical solution to differential equations.  5- Finding the mathematical model for a set of points.  6- interpolation and extrapolation. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Preparing applied engineers in the field of civil engineering who are distinguished by a high level of knowledge and analytical creativity in line with the internationally approved standards in quality assurance and academic accreditation for the corresponding engineering programs, while adhering to the ethics of the engineering profession.  A2- Enabling knowledge and understanding of practical applications in numerical ways and in accordance with the objectives of the course.  A3- The ability to identify different numerical methods.  A4- The ability to build a mathematical model to represent various engineering processes. |
| B. Subject-specific skills  B1 - The ability to analyze and discuss.  B2 - Brainstorming by encouraging students to produce a large number of ideas about an issue or problem that is raised during the lecture.  B3 - Cooperative learning by working collectively.  B4 - Competitive learning by creating an atmosphere of competition between peers. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 6 | Knowing what numerical methods and approximate solution are and how to calculate error in approximate solution | Introduction to numerical methods | Theoretical & Practical | Questions, discussion and quiz |
| 2 | 6 | Application of the bisection, fixed-point, Newton-Raphson, and modified Newton method in solving algebraic equations | Numerical solution of algebraic equations | Theoretical & Practical | Questions, discussion and quiz |
| 3 | 6 | Solving a set of simultaneous algebraic equations by numerical methods | Numerical solution to a set of algebraic equations | Theoretical & Practical | Questions, discussion and quiz |
| 4 | 6 | Application of Taylor series to approximation of functions | Taylor series | Theoretical & Practical | Questions, discussion and quiz |
| 5 | 6 | Derivation of different functions by numerical methods | Numerical differentiation | Theoretical & Practical | Questions, discussion and quiz |
| 6 | 6 | Performing the integration of different functions in numerical methods | Numerical Integration | Theoretical & Practical | Questions, discussion and quiz |
| 7 | 6 | Application of Euler's, Runge-Kutta and finite differences method in solving ODEs | Numerical solution of ordinary differential equations (ODEs) | Theoretical & Practical | Questions, discussion and quiz |
| 8 | 6 | Application of the finite difference method in solving PDEs | Numerical solution of partial differential equations (PDEs) | Theoretical & Practical | Questions, discussion and quiz |
| 9 | 6 | Finding a suitable curve for a set of points | Curve fitting | Theoretical & Practical | Questions, discussion and quiz |
| 10 | 6 | Performing interpolation and extrapolation in approximation of functions | Interpolation and extrapolation | Theoretical & Practical | Questions, discussion and quiz |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) | ERWIN KREYSZIG, ADVANCED  ENGINEERING  MATHEMATICS, NINTH EDITION, JOHN WILEY & SONS, INC., 2006. |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Follow the vocabulary of similar courses in prestigious international universities |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Theory of structures 2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| The course aims to elaborate on the principles introduced in Theory of Structures-1. It deals with the analysis of statically indeterminate structures through imposing the conditions of geometry of the deformed structure upon statics. The methods include force methods such as consistent deformations and displacement methods such as slope-deflection, and moment-distribution. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A-1 Understand the concept of Force Methods of analysis. Understand the Method of Consistent Deformations and its application to indeterminate beams.  A-2 Understand the concept of Displacement Methods of analysis. Understand the Slope-Deflection method and its application to indeterminate beams and frames. Understand the moment-distribution method and its application to indeterminate beams and frames.  A-3 Understand the concept of Strain Energy.  A-4 Understand Castigliano's theorems and their application to indeterminate beams and frames. |
| B. Subject-specific skills  B-1 Ability to analyze statically indeterminate structures and evaluate their  external reaction components.  B-2 Ability to draw shear force and bending moment diagrams for statically  indeterminate structures.  B-3 Ability to evaluate deflections at points on indeterminate structures. |
| Teaching and Learning Methods |
| 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to force methods | Force Methods | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 2 | 4 | Introduction to method of consistent deformations | Method of Consistent Deformations | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 3 | 4 | Applications to indeterminate beams | Method of Consistent Deformations | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 4 | 4 | Applications to indeterminate beams | Method of Consistent Deformations | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 5 | 4 | Introduction to displacement methods and derivation of slope-deflection method | Displacement Methods: Slope-Deflection | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 6 | 4 | Application of slope-deflection method to beams and non-sway frames | Displacement Methods: Slope-Deflection | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 7 | 4 | Introduction to concepts of stiffness and carry-over | Displacement Methods: Moment Distribution | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 8 | 4 | Modified stiffness and application to beams | Displacement Methods: Moment Distribution | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 9 | 4 | Application with support settlement | Displacement Methods: Moment Distribution | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 10 | 4 | Application to non-sway frames | Displacement Methods: Moment Distribution | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 11 | 4 | Application to non-sway frames | Displacement Methods: Moment Distribution | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 12 | 4 | Introduction to strain energy in elastic structures | Energy Methods | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 13 | 4 | Derivation and application of Castigliano's theorem | Energy Methods | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 14 | 4 | Derivation and application of Castigliano's theorem | Energy Methods | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| 15 | 4 | Analysis of indeterminate beams and frames using energy methods | Energy Methods | 1. Explanation and clarification through lectures.  2. The method of displaying scientific materials with projectors: data show, smart boards, plasma screens.  3. Self-learning through homework and mini-projects within the lectures. | • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Elementary Theory of Structures  Yan-Yu Hseih, Prentice Hall.  2.Structural Analysis  Nabeel Abdulrazzaq Jassim, Meyyada Yahya  Mohammed, Univ. of Basrah. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Soil Mechanics II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 45 hrs theoretical + 30 hrs practical |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to calculate the stresses generated in the soil and the long-term settlement resulting from these stresses. Also, evaluating the resistance of soil to shear stresses as well as normal and lateral loads. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Identifying the types of stresses in saturated soils.  A2- Studying the consolidation settlement of soils.  A3- Identify the methods used to find the shear strength of soils.  A4- Identifying the methods used for calculating the lateral earth pressure. |
| B. Subject-specific skills  B1 - Learning how to calculate stresses generated in the soil.  B2 - Studying the consolidation theory and methods used to calculate long-term settlement.  B3 - Derivation of equations used to find soil shear strength.  B4 - Derivation of equations used to assess the lateral earth pressure on the retaining structures. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. All lectures have been presented electronically and uploaded on social media platforms to be accessible to students when needed. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Knowledge of different types of soil stresses | In Situ Stresses | Lecture | Written exam |
| 2 | 3 | Fundamentals of Consolidation | Compressibility of Soil-Consolidation Settlement | Lecture | Written exam |
| 3 | 3 | Determination of Consolidation Characteristics by Laboratory Consolidation Test | Compressibility of Soil-Consolidation Settlement | Lecture | Written exam |
| 4 | 3 | Application to Laboratory Consolidation Test Results | Compressibility of Soil-Consolidation Settlement | Lecture | Written exam |
| 5 | 3 | Application to calculate primary and secondary consolidation | Compressibility of Soil-Consolidation Settlement | Lecture | Written exam |
| 6 | 3 | Determination of time rate of consolidation | Compressibility of Soil-Consolidation Settlement | Lecture | Written exam |
| 7 | 3 | How to accelerate consolidation settlement | Compressibility of Soil-Consolidation Settlement | Lecture | Written exam |
| 8 | 3 | Introduction to shear strength of soil | Shear Strength of Soil | Lecture | Written exam |
| 9 | 3 | Derivation of Mohr-Coulomb Failure Criterion | Shear Strength of Soil | Lecture | Written exam |
| 10 | 3 | Determination of shear strength parameters from laboratory tests | Shear Strength of Soil | Lecture | Written exam |
| 11 | 3 | Application of finding shear strength parameters from laboratory tests | Shear Strength of Soil | Lecture | Written exam |
| 12 | 3 | Application of finding shear strength parameters from laboratory tests | Shear Strength of Soil | Lecture | Written exam |
| 13 | 3 | Introduction to lateral earth pressure | Lateral Earth Pressure | Lecture | Written exam |
| 14 | 3 | Derivation of Rankine’s Theory of active and passive pressure | Lateral Earth Pressure | Lecture | Written exam |
| 15 | 3 | Application of Rankine’s Theory of active and passive pressure | Lateral Earth Pressure | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | - Principles of Geotechnical Engineering (By: Braja M. Das, 7th Ed.) |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | -Soil Mechanics (By: R.F. Craig, 4th Ed. or higher)  -Soil Mechanics (By: T.W. Lambe and R.V. Whitman) |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Reinforced concrete Design II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 75 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the essential method of analysis and design reinforced concrete two way slabs. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Application Examples and problem of analysis and design of two-way slab system using ACI coefficient method.  A2- analysis and design of short column.  A3- Examples and application for using design chart and table in analsyis and Design of column  A4- .application on understanding and calculation the development length of steel bars |
| B. Subject-specific skills  B1 - Apply quantitative and numerical methods for the purpose of solving engineering problems.  B2 - Use basic knowledge to research new technologies. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 5 | Slabs type | Introduction | Lecture | Written exam |
| 2 | 5 | Two way slab behavior under load | Two way slabs | Lecture | Written exam |
| 3 | 5 | Load slab transfer to adjacent beams | Two way slab | Lecture | Written exam |
| 4 | 5 | Two way slab analysis using ACI code method | Two way slab Analysis | Lecture | Written exam |
| 5 | 5 | Reinforced two way slabs system design | Two way slab Design | Lecture | Written exam |
| 6 | 5 | Application Examples on design and analysis of Two way slab | Practical Examples | Lecture | Written exam |
| 7 | 5 | Introduction | Columns | Lecture | Written exam |
| 8 | 5 | Column under concentrated axial load | Analysis of column | Lecture | Written exam |
| 9 | 5 | Column under concentrated axial load | application Examples | Lecture | Written exam |
| 10 | 5 | Column under uniaxial load | Analysis and design of column | Lecture | Written exam |
| 11 | 5 | Column under uniaxial load | application Examples | Lecture | Written exam |
| 12 | 5 | Column under biaxial loads | Analysis and design of column | Lecture | Written exam |
| 13 | 5 | Column under biaxial loads | application Examples | Lecture | Written exam |
| 14 | 5 | Introduction | Development length | Lecture | Written exam |
| 15 | 5 | Application examples | Development length | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) | - Structural Concrete Theory and Design , By Nadim Hasson, Akthem Aktham Al manseer , 6th Edition 2015  2- Reinforced concrete design , 7th Edition 2007 By Chu Kai Wang, Charles G salmon and Joe A Pincheire  3- Design of Reinforced concrete Structures , 2nd Edition 2008 By Mohammed Tharwat Ghonein, Vol. 3  4- Design of concrete Structure , 14th Edition 2010 By Arthur H. Nilson , Daved Derwin and Charles W . Dolan  5- Reinforced concrete design , 6th Edition 2009 By Edward G. Nawy  6- ACI Code 318- 2019 |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |
| 12. Course development plan | |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides the possibility of designing different drainage systems, providing accurate details of soil permeability and the method of calculating the permeability coefficient, types of trocars and their differences, the design of open drainage channels and the design of covered trocars, the distance between tubular trocars and details of vertical drainage. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Drainage Engineering |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of drainage engineering systems and their applications in agricultural fields.  A2- Gaining the ability to deal with the problems of rising groundwater levels. Acquisition of basic skills in managing puncture systems.  A3- Gaining experience in designing the puncture system and its suitability according to the different surrounding conditions. Gaining experience in knowing the difference between the old and modern puncture systems.  A4- Optimum management of the puncture system. |
| B. Subject-specific skills  B1 - The ability to design puncture systems in their various ways.  B2 - The ability to think about the problems of rising groundwater levels.  B3 - Writing scientific reports and reading charts and tables. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Definition of drainage, and benefits of drainage | Introduction | theoretical | questions and discussion |
| 2 | 3 | drainage project investigations | Introduction | theoretical | questions and discussion |
| 3 | 3 | Soil permeability, a method for calculating the permeability coefficient | Introduction | theoretical | questions and discussion |
| 4 | 3 | Types of drainage system | Drainage networks | theoretical | questions and discussion |
| 5 | 3 | Open channel of drainage system | Drainage networks | theoretical | questions and discussion |
| 6 | 3 | Vertical drainage | Drainage networks | theoretical | questions and discussion |
| 7 | 3 | Continuity equation, Manning equation | Design of drainage system | theoretical | questions and discussion |
| 8 | 3 | Examples for design of drainage system | Design of drainage system | theoretical | questions and discussion |
| 9 | 3 | Examples for design of drainage system | Design of drainage system | theoretical | questions and discussion |
| 10 | 3 | Hooghoudt equation | Spacing of drains | theoretical | questions and discussion |
| 11 | 3 | Hooghoudt equation for layered soil | Spacing of drains | theoretical | questions and discussion |
| 12 | 3 | Equivalent depth | Spacing of drains | theoretical | questions and discussion |
| 13 | 3 | Hydraulic conductivity in the case of steady flow of a confined and unconfined aquifer | Vertical drainage | theoretical | questions and discussion |
| 14 | 3 | Hydraulic conductivity in case of unsteady flow | Vertical drainage | theoretical | questions and discussion |
| 15 | 3 | Pumping from multiple wells | Vertical drainage | theoretical | questions and discussion |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Economy |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the fundamentals of project management with special focus on Project Selection stage, cost estimation, cash flow, Crashing, EVM, Risk management and contracts | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Introduction, strategic planning, Project Selection process.  A2- Earn Value Management and project compression technique.  A3- Risk and Procurement Management.  A4- Stakeholder and Human resource Management |
| B. Subject-specific skills  B1 – economic evaluation methods and cost estimation  B2 – application of EVM and crashing techniques. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | Introduction to Strategic Planning and Project Selection | Introduction to project management | Lecture | Written exam |
| 2 | 2 | Project Selection Methods | Simple and Compound Interest | Lecture | Written exam |
| 3 | 2 | Project Selection Methods | Net Present Value (NPV) | Lecture | Written exam |
| 4 | 2 | Project Selection Methods | Payback Period (PP) | Lecture | Written exam |
| 5 | 2 | Project Selection Methods | Return On Investment (ROI), Internal Rate of Return (IRR) | Lecture | Written exam |
| 6 | 2 | Project Selection Methods | Accounting Rate of Return (ARR) | Lecture | Written exam |
| 7 | 2 | Cost Management | Cost Estimation | Lecture | Written exam |
| 8 | 2 | Cost Management | Cash Flow | Lecture | Written exam |
| 9 | 2 | Project Monitoring and Control | Crashing | Lecture | Written exam |
| 10 | 2 | Project Monitoring and Control | EVM | Lecture | Written exam |
| 11 | 2 | Risk Management | Planning for Risk | Lecture | Written exam |
| 12 | 2 | Procurement Management | Contracts | Lecture | Written exam |
| 13 | 2 | Linear Programming | LP Formulation and LP Simplex | Lecture | Written exam |
| 14 | 2 | Stakeholder Management | Stakeholder Management | Lecture | Written exam |
| 15 | 2 | Human resource management | Human resource management | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. A Guide to the project management body of knowledge - PMI.  2. إدارة المشاريع الإنشائية والعلاقات المهنية: احسان العطار |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | 1. Project Management, A Systems Approach to Planning, Scheduling, and Controlling, 10th edition, KERZNER  2. Principles of Construction management By: Roy Piltcher  3. Construction Planning, Programming and Control by Brian Cooke  4. Operations Management Creating Value Along the Supply Chain Russell - Chapter 9: Project management |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Transportation Engineering |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| This course aims to present the basic concepts of transportation planning as an introduction to studying the process of travel demand forecasting and public transportation. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Application of the basic elements of transportation planning.  A2- Application of the sequential steps of the travel demand forecasting process (four-step process).  A3- Introduction/Entrance to public transportation. |
| B. Subject-specific skills  B1 - Ability to identify and analyze engineering problems  B2 - Apply quantitative and numerical methods for the purpose of solving transportation engineering problems.  B3 - Ability to design, collect, analyze and interpret data and data. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Introduction to Transportation Engineering | Introduction and Background | Lecture | Written exam |
| 2 | 3 | Introduction to Transportation Engineering | History of transportation engineering | Lecture | Written exam |
| 3 | 3 | Introduction to Transportation Engineering | Modes of Transportation & mode selection | Lecture | Written exam |
| 4 | 3 | Transportation Planning | Urban transportation Planning | Lecture | Written exam |
| 5 | 3 | Transportation Planning | Basic Elements of Transportation Planning | Lecture | Written exam |
| 6 | 3 | Travel Demand Forecasting | Travel Demand Forecasting process | Lecture | Written exam |
| 7 | 3 | Travel Demand Forecasting | Data Collection | Lecture | Written exam |
| 8 | 3 | Travel Demand Forecasting | Trip Generation | Lecture | Written exam |
| 9 | 3 | Travel Demand Forecasting | Trip Generation | Lecture | Written exam |
| 10 | 3 | Travel Demand Forecasting | Trip Distribution | Lecture | Written exam |
| 11 | 3 | Travel Demand Forecasting | Modal Split | Lecture | Written exam |
| 12 | 3 | Travel Demand Forecasting | Traffic Assignment | Lecture | Written exam |
| 13 | 3 | Public Transportation | Bus and Rail Operations | Lecture | Written exam |
| 14 | 3 | Public Transportation | Capacity of Bus Stop | Lecture | Written exam |
| 15 | 3 | Public Transportation | Constructing Route Schedule | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Traffic & Highway Engineering (4th Edition, SI)  Nicholas J. Garber and Lester A. Hoel Cengage Learning, Stamford, USA, 2010. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Update and develop academic subjects periodically. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Computer Applications -II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 3rd year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to introduce the structural analysis and design using CSI ETABS. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Structural analysis and design of structures using CSI ETABS. |
| B. Subject-specific skills  B1- Structural analysis and design of structures using CSI ETABS. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | Introduction to Etabs | Introduction to Etabs | Practice | Practical exam |
| 2 | 4 | Modelling of the Structures | Modelling of the Structures | Practice | Practical exam |
| 3 | 4 | Modelling of the Structures | Modelling of the Structures | Practice | Practical exam |
| 4 | 4 | Modelling of the Structures | Modelling of the Structures | Practice | Practical exam |
| 5 | 4 | Loading Definition | Loading Definition | Practice | Practical exam |
| 6 | 4 | Loading Application | Loading Application | Practice | Practical exam |
| 7 | 4 | Lateral Loads | Lateral Loads | Practice | Practical exam |
| 8 | 4 | Structural Analysis | Structural Analysis | Practice | Practical exam |
| 9 | 4 | Results Display | Results Display | Practice | Practical exam |
| 10 | 4 | Results Display | Results Display | Practice | Practical exam |
| 11 | 4 | Reinforced Concrete Frame Design | Reinforced Concrete Frame Design | Practice | Practical exam |
| 12 | 4 | Reinforced Concrete Frame Design | Reinforced Concrete Frame Design | Practice | Practical exam |
| 13 | 4 | Steel Frame Design | Steel Frame Design | Practice | Practical exam |
| 14 | 4 | Steel Frame Design | Steel Frame Design | Practice | Practical exam |
| 15 | 4 | Export and Import Files | Export and Import Files | Practice | Practical exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1CSI ETABS Manuals |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Adding practical laboratory hours to conduct mechanics of material experiments |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Prestressed concrete is a type of reinforced concrete that contains reinforcing bars that have been pre-stressed in order to generate initial stresses in the concrete section that are inherently opposite to the stresses that the structure is likely to be exposed to during service use. This is done by pulling (or stringing) a special type of heavy-duty bars to a certain amount inside the concrete and then releasing it after ensuring its impediment from returning to its original position and based on Newton’s laws and other engineering laws that will in turn apply opposite stresses on the concrete, which are the initial stresses that make concrete pre-stressed based |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Prestressed concrete design |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 4th year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Giving students an adequate idea of how to manufacture, install and dispose of pre-stressed concrete and its uses, as well as how to design pre-stressed concrete beams. Calculation of live and dead loads lifted on the precast concrete structure. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of pre-stressed concrete.  A2- Acquisition of skills in dealing with problems and issues related to pre-stressed concrete.  A3- Acquisition of basic skills as an introduction to the design and implementation of prestressed concrete.  A4- Gain a basic understanding of how this type of concrete works. |
| B. Subject-specific skills  B1 - The ability to understand the mechanism of prestressing.  B2 - The ability to think about addressing a particular problem or issue.  B3 - Writing scientific reports.  B4 - The ability to gain experience in dealing with solving structural problems related to prestressing. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 |  | effects of prestressing and advantages and disadvantages | theory | Questions and discussion |
| 2 | 4 |  | materials of prestress concrete | theory and tutorial | Questions and discussion and quiz |
| 3 | 4 |  | prestressing systems and equipment | theory | Questions and discussion |
| 4 | 4 |  | concrete stress control by prestressing | theory and tutorial | Questions and discussion and quiz |
| 5 | 4 |  | loss of prestress force | theory | Questions and discussion |
| 6 | 4 |  | elastic flexural analysis | theory and tutorial | Questions and discussion |
| 7 | 4 |  | elastic flexural analysis | theory | Questions and discussion |
| 8 | 4 |  | flexural strength | theory | Questions and discussion and quiz |
| 9 | 4 |  | flexural strength | theory and tutorial | Questions and discussion |
| 10 | 4 |  | shear in prestressed concrete beams | theory | Questions and discussion |
| 11 | 4 |  | shear in prestressed concrete beams | theory | Questions and discussion |
| 12 | 4 |  | camber and deflections | theory and tutorial | Questions and discussion |
| 13 | 4 |  | camber and deflections | theory | Questions and discussion and quiz |
| 14 | 4 |  | yield line analysis for slabs | theory | Questions and discussion |
| 15 | 4 |  | yield line analysis for slabs | theory and tutorial | Questions and discussion |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | * Design of Concrete Structures, David Darwin, Charles W. Dolan, Arthur H. Nilson, McGraw-Hill. * Design of prestressed Concrete, Arthur H. Nilson, John Wily and Sons * Prestressed Concrete Building, Design, and Construction, Charles W. Dolan and H.R.(Trey) Hamilton, Springer.   Design of prestressed Concrete Structures, T.Y. Lin and Ned H. Burns, John Wily and Sons |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| * Conducting multiple visits to prestressed concrete plants or work sites for the purpose of gaining on-site experience |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Foundation Engineering-I |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 4th year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to know the designs of shallow foundations so that no shear failure occurs in the supporting soil for the foundation and foundation settlement is within the allowable value. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Knowing how to conduct field investigations.  A2- Knowing the methods of calculating the bearing capacity of the soil for shallow foundations.  A3- Knowing the factors affecting the bearing capacity of the soil.  A4- Knowing how to calculate the immediate, consolidation and secondary settlement. Knowing how to calculate the stresses in the soil mass as a result of loads of different shapes applied to the soil surface. |
| B. Subject-specific skills  B1 – Design of shallow foundations for buildings so that the loads of the buildings transfer to the soil safely.  B2 - Determine the number and depth of boring required in the soil investigations.  B3 - Determine the total settlement that occurs under the shallow foundations. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | - Definition  - Foundation Classification  - General Requirements of Foundations  - Foundation Selection | Introductory Concepts | Lecture | Written exam |
| 2 | 4 | - Purpose of Sub-soil Exploration  - Planning for Site Investigation  - Methods of Soil Exploration | Site Investigations | Lecture | Written exam |
| 3 | 4 | - Soil Samples  - Causes of Disturbance  - Soil Samplers  - Number of Borings | Site Investigations | Lecture | Written exam |
| 4 | 4 | - Depth of Borings  - Field Tests | Site Investigations | Lecture | Written exam |
| 5 | 4 | - Soil Exploration Report  - Bearing Failure Patterns | Soil Bearing Capacity for Shallow Foundations | Lecture | Written exam |
| 6 | 4 | - Terzaghi’s Ultimate Bearing Capacity Equation  - Factor of Safety | Soil Bearing Capacity for Shallow Foundations | Lecture | Written exam |
| 7 | 4 | - Ground Water Table Effect  - Meyerhof’s Bearing Capacity Equations  - General (Hansen’s) Bearing Capacity Equations | Soil Bearing Capacity for Shallow Foundations | Lecture | Written exam |
| 8 | 4 | - Skempton’s Method [ φ = 0]  - Foundations Under Eccentric Loads | Soil Bearing Capacity for Shallow Foundations | Lecture | Written exam |
| 9 | 4 | - Footings on Layered Soils  - Footings Adjacent to a Slope | Soil Bearing Capacity for Shallow Foundations | Lecture | Written exam |
| 10 | 4 | -Bearing Capacity From Field Tests | Soil Bearing Capacity for Shallow Foundations | Lecture | Written exam |
| 11 | 4 | - Foundations Subjected to Uplift or Tension Forces  - Types of Settlement  - Contact Pressure | Foundation Settlement | Lecture | Written exam |
| 12 | 4 | -Stresses in the Soil Mass | Foundation Settlement | Lecture | Written exam |
| 13 | 4 | -Immediate Settlement  Semi-infinite mass  Saturated clay underlain by a hard stratum | Foundation Settlement | Lecture | Written exam |
| 14 | 4 | -Consolidation Settlement  Compressibility characteristics  Pre-consolidation pressure  In-situ (e-log σ’) curve  -Calculation of one-dimensional consolidation settlement | Foundation Settlement | Lecture | Written exam |
| 15 | 4 | -Rate of consolidation settlement  Correction for construction period  -Secondary Settlement  -Allowable Settlement | Foundation Settlement | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Foundation Analysis and Design, 5th Ed, Bowles, 1996. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | Principles of Foundation Engineering, 9th Ed, Das, 2019. |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides the basic information for the properties of steel material and to identify the different design methods of steel structures and how to design structural members subjected to flexural forces, both lateral supported and not lateral supported. Also learn how to design the connections between the structural members |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Design of steel structures-2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Definition of the structural properties of iron. * Introducing the methods of designing steel structures. * Design of structural members subject to flexion. * Design of links using screws and welding. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of design  A2- Acquisition of skills in designing members of steel structures subjected to flexural forces.  A3- Recognize the design of the links between the structural members.  . |
| B. Subject-specific skills  B1 - The ability to design members of steel structures subject to bending.  B2 - The ability to design different links for the structural members.  B3 - Writing scientific reports.  B4 - The ability to gain experience in dealing with programmed systems. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 |  | introduction | Lectures and discussions | questions |
| 2 | 3 |  | Limit states for steel design | Lectures and discussions | questions |
| 3 | 3 |  | Working and factored loads | Lectures and discussions | questions |
| 4 | 3 |  | Materials properties and specification | Lectures and discussions | Questions and quiz |
| 5 | 3 |  | Design of beams | Lectures and discussions | questions |
| 6 | 3 |  | Laterally supported beams | Lectures and discussions | questions |
| 7 | 3 |  | Laterally unsupported beams | Lectures and discussions | questions |
| 8 | 3 |  | Design for flexure | Lectures and discussions | questions |
| 9 | 3 |  | Web bearing and web buckling | Lectures and discussions | questions |
| 10 | 3 |  | Design of gantry girders | Lectures and discussions | questions |
| 11 | 3 |  | Moment capacity | Lectures and discussions | questions |
| 12 | 3 |  | Design for shear | Lectures and discussions | questions |
| 13 | 3 |  | Bolted connections | Lectures and discussions | Questions and quiz |
| 14 | 3 |  | Bolted connections | Lectures and discussions | questions |
| 15 | 3 |  | Welded connections |  | questions |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | -Structural steelwork design to limit state theory . by D. Lam  -BS 5950 part-1  - steelwork design guide to BS 5950-1 |
| 2. Key references (sources) | BS 5950 part-1 |
| A- Recommended books and references (scientific journals, reports ,.... | Steelwork design guide to BS 5950-1 |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Study and design of different types of hydraulic installations. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Hydraulic structures |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 4th year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Ability to design and implement hydraulic installations. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Cognitive abilities. Understanding the types of hydraulic installations. |
| B. Subject-specific skills  B1 - Ability to work on civil engineering projects. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 |  | Intoduction |  |  |
| 2 | 4 |  | Piping and seepagr |  |  |
| 3 | 4 |  | Design of floor |  |  |
| 4 | 4 |  | Bligh method |  |  |
| 5 | 4 |  | Lane method |  |  |
| 6 | 4 |  | Khosla method |  |  |
| 7..15 | 4 |  | Hydraulic jumpe  Stilling basin  Vertical drop  Culvert  Aqueduct  Siphon  Vertical gate  Weir |  |  |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Hydraulic structures by Novak |
| 2. Key references (sources) | Theorynand Design of irragation structures by Gupta |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Highway engineering is a multidisciplinary field with interconnected sub disciplines that include planning, safety, operations, design, and related fields such as structural, hydraulic, and geotechnical engineering. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Highway Engineering/415 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st Semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic element for geometric design for highway and deals with the dimensions and layout of visible features of the highway. The features normally considered are the cross section elements, sight distance consideration, horizontal curvature, gradients, and intersection. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding highway design features  A1- The history of highway engineering gives us an idea about the roads of ancient times.  A2- The emphasis of the geometric design is to address the requirement of the driver and the vehicle such as safety, comfort, efficiency, etc.  A3- The characteristics of cross-sectional elements are important in highway geometric design because they influence the safety and comfort.  A4- Horizontal alignment is one of the most important features influencing the  efficiency and safety of a highway. |
| B. Subject-specific skills  B1 - Proper design of a horizontal curve, including elements within a single curve and consistency of curvature along a highway.  B2 - Design speed is the single most important factor that affects the geometric design.  B3 - Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and design solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Introduction to Highway Engineering | History of Highway Engineering | Lecture | Oral exam |
| 2 | 3 | Introduction to geometric design | Factors affecting geometric design | Lecture | Oral exam |
| 3 | 3 | Road classification | Factors affecting classification of roads | Lecture | Oral exam |
| 4 | 3 | Cross Sectional Element | Right of Highway | Lecture | Oral exam |
| 5 | 3 | Highway Location | Principle of Highway Location | Lecture | Oral exam |
| 6 | 3 | Horizontal alignment I | Analysis of super-elevation | Lecture | Written exam |
| 7 | 3 | Horizontal alignment II | Extra Widening | Lecture | Written exam |
| 8 | 3 | Horizontal alignment III | Horizontal Curve Fundamentals | Lecture | Written exam |
| 9 | 3 | Horizontal alignment III | Reverse, compound, and Spiral curves | Lecture | Written exam |
| 10 | 3 | Horizontal alignment IV | Sight Distance on Horizontal Curve | Lecture | Written exam |
| 11 | 3 | Vertical Alignment | Parabolic Formula | Lecture | Written exam |
| 12 | 3 | Macadam Bases & Stabilization | Stabilized Bases & Subases | Lecture | Written exam |
| 13 | 3 | Earthworks & Subgrades | Compaction | Lecture | Written exam |
| 14 | 3 | Earthworks & Subgrades | Control of Embankment Construction | Lecture | Written exam |
| 15 | 3 | Highway Drainage | Surface Drainage System Design | Lecture | Written exams |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1-Handbook: The Handbook of Highway Engineering.By T.F.Fwa.2006.  2. Hand book : Highway Engineering Handbook .By Roger.L.b.and Kenneth J. 2nd.ed. 2004. . |
| 2. Key references (sources) | Hand book: Handbook of Transportation Engineering. By Myer Kutz.2004. |
| A- Recommended books and references (scientific journals, reports ,.... | AASHTO (1993) |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Addition new exam and subject |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Water supply engineering |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the material deals with water distribution and treatment. It presents all the details of hydraulic design of water treatment plant units. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1-water quantity calculation.  A2- piping materials description.  A3- water distribution systems.  A4- design of water treatment plant units. |
| B. Subject-specific skills  B1- Mathematical solution of problems governing design of water distribution and treatment systems.  B2- EXCEL Sheets for fascinating the solution of repeated calculations. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | The students will learn how to calculate the water quantity required for different uses and how to estimate future population | Quantity of Water | Lecture | Written exam |
| 2 | 3 | The students will learn How to select the material of pipes and what are the types of pipes and fittings | Piping materials | Lecture | Written exam |
| 3 | 3 | The students will have a knowledge about the types and components of water distribution systems and how to analyze these systems using Hardy Cross method. | Water distribution systems | Lecture | Written exam |
| 4 | 6 | The students will have a knowledge about the types of pumping stations and pumps and how to select the appropriate pumps according to the characteristics of flow system. | Water pumping stations | Lecture | Written exam |
| 5 |
| 6 | 3 | The students will learn what are the types of water intake structures and how to design these structures. | Water intakes | Lecture | Written exam |
| 7 | 3 | The students will have a knowledge about the types of water sources and water impurities and what are the components of conventional water treatment plant. They will learn, also, how to design rapid mix unit | Water treatment: introduction and rapid mix unit | Lecture | Written exam |
| 8 | 3 | The students will have a knowledge about the coagulation process, the types of coagulants and how to determine the required coagulant dose and how to design a chemical feed system. | Water treatment: Coagulation process | Lecture | Written exam |
| 9 | 6 | The students will have a knowledge about flocculation process and the types of flocculation units and how to design flocculation unit. | Water treatment: Flocculation unit | Lecture | Written exam |
| 10 | Lecture | Written exam |
| 11 | 3 | The students will have a knowledge about Introduction the sedimentation process, classes of settling and efficiency of discrete and flocculant settling processes. | Water treatment: Sedimentation process | Lecture | Written exam |
| 12 | 3 | The students will learn what are the types of sedimentation tanks, the components of sedimentation tanks and how to design sedimentation unit. | Water treatment: Sedimentation unit | Lecture | Written exam |
| 13 | 3 | The students will have a knowledge about the types of water filters and how to design filtration unit | Water treatment: Filtration unit | Lecture | Written exam |
| 14 | 3 | Lecture | Written exam |
| 15 | 3 | The students will have a knowledge about the types of water disinfectants and how to how to calculate disinfectant dose. | Water treatment: Disinfection unit | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Steel, E. W. and McGhee, T. J., “Water supply and sewerage”, McGraw-Hill KOGAKUSHA, LTD, 1979. |
| 2. Key references (sources) | 1. Vissman, W., Hammer, M. and Perez, E. M., “Water supply and pollution control”, 8th Ed., Pearson Education Limited, 2014. 2. Binnie, C. and Kimber, M., “Basic water treatment”, 5th Ed., Thomas Telford Limited, 2013. |
| A- Recommended books and references (scientific journals, reports ,.... | 1. Barut, E. E., “Water treatment plant design”, 4th Ed., McGraw-Hill, Inc., 2005. 2. Journal of Environmental Engineering |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| The course is considered complete in line with the hours allocated for it. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Methods of Construction |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 1st semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The aim of the course is to provide the student by the necessary information and tools required for the site engineer in projects, costs and management of equipment. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- The costs of ownership and operating the equipment.  A2- Knowledge of the appropriate type of equipment for earth works.  A3- The methods of determining the productivity of equipment.  A4- The forces and moments relating to concrete formworks. |
| B. Subject-specific skills  B1 – Application of determining the ownership and operation of construction equipment.  B2 – Determining the production of equipment.  B3 – Design the forms of concrete structures. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Ownership cost | Depreciation | Lecture | Written exam |
| 2 | 3 | Ownership cost | Costs of insurance, tax, storage, and investment. | Lecture | Written exam |
| 3 | 3 | Operation cost | Cost of fuel and lubrication | Lecture | Written exam |
| 4 | 3 | Operation cost | Maintenance, tyre and operator costs. | Lecture | Written exam |
| 5 | 3 | Replacement and useful life | Evaluation of economic life | Lecture | Written exam |
| 6 | 3 | Power of equipment | Resistance of equipment. | Lecture | Written exam |
| 7 | 3 | Power of equipment | Actual horse power and traction force. | Lecture | Written exam |
| 8 | 3 | Earthwork equipment | Swelling and shrinkage | Lecture | Written exam |
| 9 | 3 | Soil compaction | Rollers and compactors | Lecture | Written exam |
| 10 | 3 | Tractors | Types and operation of Tractors | Lecture | Written exam |
| 11 | 3 | Scraper Types, work and productivity | Scrapers | Lecture | Written exam |
| 12 | 3 | Earth Hauling Equipment Production Calculation and Selection | Earth hauling Equipment | Lecture | Written exam |
| 13 | 3 | Soil loading types and productivity | Soil loading equipment | Lecture | Written exam |
| 14 | 3 | Types and productivity of digging equipment | Power Shovel | Lecture | Written exam |
| 15 | 3 | concrete formworks | Design of concrete formworks | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. **Peurif oy, P .E. “Construction Planning,**  **Equipment, and Methods”** |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Foundation Engineering-II |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 4th year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| The course aims to   * Structural design of shallow foundation. * Knowing the ultimate bearing capacity of single piles and pile groups. * Knowing the stability of the sheet-pile walls. * Design of the structural members of braced cuts. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Knowing the structural design of shallow foundations including single, combined and mat foundations.  A2- Knowing the ultimate bearing capacity of individual piles and pile groups.  A3- Knowing the stability of the sheet-pile walls (cantilever and anchored).  A4- Knowing the design of the structural members in the braced cuts. |
| B. Subject-specific skills  B1 - Determine type of the foundation that is suitable for the building.  B2 – Structural design of shallow foundation.  B3 - Determine the bearing capacity of the piles to carry the applied loads of the buildings.  B4 - Determine the stability of the sheet-pile walls. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 | -Spread Footings (Pad and Wall)  -Eccentrically Loaded Spread Footings | Structural Design of Shallow Foundations | Lecture | Written exam |
| 2 | 4 | -Rectangular Combined Footings  -Trapezoidal Combined Footings | Structural Design of Shallow Foundations | Lecture | Written exam |
| 3 | 4 | -Strap Footings  -Raft (Mat) Foundations | Structural Design of Shallow Foundations | Lecture | Written exam |
| 4 | 4 | Piled foundations  -Introduction  Definition  Uses  Types  Choice  Design criteria | Piled Foundations | Lecture | Written exam |
| 5 | 4 | -Ultimate Static Pile Capacity  Ultimate point capacity | Piled Foundations | Lecture | Written exam |
| 6 | 4 | Skin resistance capacity | Piled Foundations | Lecture | Written exam |
| 7 | 4 | -Pile Groups  Group efficiency  Capacity of a pile group | Piled Foundations | Lecture | Written exam |
| 8 | 4 | Settlement of a pile group | Piled Foundations | Lecture | Written exam |
| 9 | 4 | -Load distribution in a pile group  -Negative Skin Friction | Piled Foundations | Lecture | Written exam |
| 10 | 4 | Sheet-Pile Walls  -Review of Lateral Earth Pressure  Coulomb earth pressure theory  Rankine earth pressure theory  -Sheet-Pile Walls  Types of sheet piling  Safety factors  -Cantilever Sheet piling  Cantilever sheet piling in granular soil | Sheet-Pile Walls | Lecture | Written exam |
| 11 | 4 | Cantilever sheet piling in cohesive Soils (φ = 0)  -Anchored Sheet piling; Free-Earth Support  Rowe's moment reduction applied to free-earth support method | Sheet-Pile Walls | Lecture | Written exam |
| 12 | 4 | Capacity of deadman  Location of deadman  -Braced Cuts  Pressure envelope for braced-cut design | Sheet-Pile Walls | Lecture | Written exam |
| 13 | 4 | Design of various components of a braced cut  Bottom heaving of a cut in clay  Slope Stability  -Types of Slips  -Stability Analysis  -Total Stress Versus Effective Stress Analyses | Sheet-Pile Walls | Lecture | Written exam |
| 14 | 4 | -Simplified Methods of Stability Analysis  Infinite slopes  Triangular cross-section  Cylindrical failure (φ = 0 condition)  Cylindrical failure (Taylor's stability charts | Slope Stability | Lecture | Written exam |
| 15 | 4 | -Slices Methods of Stability Analysis  Fellenius method  Simplified Bishop's method | Slope Stability | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Foundation Analysis and Design, 5th Ed, Bowles, 1996. |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... | Principles of Foundation Engineering, 9th Ed, Das, 2019. |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides the basic information for the properties of steel material and to identify the different design methods of steel structures and how to design structural members subjected to flexural forces, both lateral supported and not lateral supported. Also learn how to design the connections between the structural members |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Design of steel structures-2 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Definition of the method of designing iron joists made of plates. * Designs members subject to tension. * Design of members subject to compression. * Column base design. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of design  A2- Acquisition of skills in designing members of steel structures subjected to tensile or compressive forces  A3- Understand the design of links and column bases.  . |
| B. Subject-specific skills  B1 - The ability to design members of steel structures subject to tensile or compression.  B2 - The ability to design plate joists.  B3 - The ability to design column bases |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 |  | Design of plate girders | Lectures and discussions | questions |
| 2 | 3 |  | Moment capacity | Lectures and discussions | questions |
| 3 | 3 |  | Web design | Lectures and discussions | questions |
| 4 | 3 |  | Stiffeners design | Lectures and discussions | Questions and quiz |
| 5 | 3 |  | Tension members | Lectures and discussions | questions |
| 6 | 3 |  | Members with eccentric connections | Lectures and discussions | questions |
| 7 | 3 |  | Tension members with moments | Lectures and discussions | questions |
| 8 | 3 |  | Compound tension members | Lectures and discussions | questions |
| 9 | 3 |  | Compression members | Lectures and discussions | questions |
| 10 | 3 |  | Axially loaded compression members | Lectures and discussions | questions |
| 11 | 3 |  | Built-up columns | Lectures and discussions | questions |
| 12 | 3 |  | Members subjected to compression plus bending | Lectures and discussions | questions |
| 13 | 3 |  | Moments in columns of simple constructions | Lectures and discussions | Questions and quiz |
| 14 | 3 |  | Design of column base plate | Lectures and discussions | questions |
| 15 | 3 |  | Design of column base plate |  | questions |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | -Structural steelwork design to limit state theory . by D. Lam  -BS 5950 part-1  - steelwork design guide to BS 5950-1 |
| 2. Key references (sources) | BS 5950 part-1 |
| A- Recommended books and references (scientific journals, reports ,.... | Steelwork design guide to BS 5950-1 |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The course provides general information about the water cycle and its relationship to everything that affects human life from the abundance of water suitable for consumption, as well as methods for calculating its quantities. Also the relationship of rain to the design of drainage networks and the drainage of rain water in cities. As well as information on engineering precautions to ward off the potential risk of flooding. |

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| 1. Teaching Institution | Basrah University |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering Hydrology |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 4th year |
| 6. Number of hours tuition (total) | 60 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course (Engineering Hydrology) aims to introduce the civil engineering student in the fourth stage to the various water sources, especially the sources of water coming from the atmosphere in the form of all forms of precipitation, especially rain. As well as the definition of the relationship of these precipitations to the abundance of fresh water through the study of methods of measuring the amount of rain reaching the surface of the earth and knowing the amount of water that will be lost in the form of evaporation or infiltration into the ground and the relationship of all this to the drainage of rivers and ways to benefit from it in the form of storage in fresh water bodies such as lakes and marshes. Also, one of the course objectives is to introduce the student to groundwater, how to calculate its quantities, and ways to benefit from and preserve it, as it is one of the important water sources. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts of hydrology and its relationship to civil engineering.  A2- Acquisition of skills in designing rainwater drainage networks.  A3- Acquire basic skills in measuring and forecasting the future of rain and its relationship to river drainage and annual water quantities.  A4- Gain a basic understanding of engineering designs and their applications in relation to rivers, dams and ferries bridges and flood protection installations. |
| B. Subject-specific skills  B1 - The ability to understand the relationship of rain with engineering water phenomena.  B2 - The ability to find solutions to extreme natural weather phenomena such as flooding.  B3 - Writing detailed scientific reports for water accounts.  B4 - The ability to gain experience in dealing with executive engineering plans for water facilities. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |

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| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 4 |  | Introduction |  | Class |
| 2 | 4 |  | Water Cycle |  | Class |
| 3 | 4 |  | Precipitations |  | Class |
| 4 | 4 |  | Rain Gages |  | Class |
| 5 | 4 |  | Average Rain |  | Class |
| 6 | 4 |  | Evaporation |  | Class |
| 7 | 4 |  | Infiltration |  | Class |
| 9 | 4 |  | Measurements of rivers |  | Class |
| 10 | 4 |  | Rating curve |  | Class |
| 11 | 4 |  | Hydrographs |  | Class |
| 12 | 4 |  |  | Class |
| 13 | 4 |  | Analysis of a Hydrograph |  | Class |
| 14 | 4 |  |  | Class |
| 15 | 4 |  |  | Class |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER |  |
| 2. Key references (sources) | **Engineering hydrology/ Subramanya 2008** |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Pavement Design and Analysis deals with the study of different types of pavement like flexible pavement and rigid pavement, and study the materials of creates these types of pavements and properties, behaviors, and specifications. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Pavement Design and Analysis /425 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd Semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the basic element for design the pavement (flexible & Rigid) also analyze all stresses and applied loads on the pavement and take in the consider choose the materials which used in the pavement construction. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding of pavement design and analysis.  A1- Bituminous materials, Natural Asphalt, constituents of asphalt cement, and test of asphalt  A2- The emphasis of the different aggregate characteristics with size and gradation, and methods of blending for dry mix design.  A3- Bituminous mix design, with the objective of mix design.  A4- Study of stress distribution through the pavement with the calculation of flexible pavement stresses and deflections. |
| B. Subject-specific skills  B1 – Marshal mix design determines the optimum bitumen content for the mix of the flexible pavement.  B2 – Flexible pavement design methods (CBR method and AASHTO Design method).  B3 – Rigid pavement types and types of joints in the rigid pavement, and temperature stresses. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and design solving skills are further developed employing a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | Bituminous Materials | Test for Asphalt | Lecture | Oral exam |
| 2 | 3 | Aggregate | Physical Properties of Aggregate | Lecture | Oral exam |
| 3 | 3 | Gradation | Methods of Blending | Lecture | Written exam |
| 4 | 3 | Bituminous Mix Design | The objective of Mix Design | Lecture | Oral exam |
| 5 | 3 | Marshal Mix Design | Marshall Stability and Flow | Lecture | Written exam |
| 6 | 3 | Stress distribution through the pavement | Calculation of stresses and deflections | Lecture | Written exam |
| 7 | 3 | Introduction to pavement design | Types of pavements | Lecture | Oral exam |
| 8 | 3 | Flexible pavement design methods | CBR Method | Lecture | Written exam |
| 9 | 3 | Flexible pavement design methods | AASHTO Design Method | Lecture | Written exam |
| 10 | 3 | Flexible pavement design methods | Cumulative ESAL | Lecture | Written exam |
| 11 | 3 | Rigid Pavement | Rigid Pavement Types | Lecture | Oral exam |
| 12 | 3 | Rigid Pavement | Types of Joints in Rigid Pavement | Lecture | Oral exam |
| 13 | 3 | Rigid Pavement | Critical load position | Lecture | Written exam |
| 14 | 3 | Rigid Pavement | Temperature Stresses | Lecture | Written exam |
| 15 | 3 | Check Points | Rigid Pavement | Lecture | Written exams |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1-Handbook: The Handbook of Highway Engineering.By T.F.Fwa.2006.  2. Hand book : Highway Engineering Handbook .By Roger.L.b.and Kenneth J. 2nd.ed. 2004. . |
| 2. Key references (sources) | Hand book: Handbook of Transportation Engineering. By Myer Kutz.2004. |
| A- Recommended books and references (scientific journals, reports ,.... | AASHTO (1993) |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| Addition new exam and subject |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Sanitary engineering/ CE426 |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to present the material deals with sewer systems and sanitary sewage treatment plant description and design. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Determination of storm water and sanitary sewage quantities.  A2- Design of sewer systems.  A3- Design of sewage treatment units. |
| B. Subject-specific skills  B1- Mathematical solution of problems governing design of sewer systems and sewage treatment plant.  B2- EXCEL Sheets for fascinating the solution of repeated calculations. |
| Teaching and Learning Methods |
| • Scientific and research skills are developed through teaching and learning activities. Analysis and problem solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 | The students will learn how to calculate sanitary sewage and storm water quantities | Quantity of sewage | Lecture | Written exam |
| 2 | 6 | The students will have a knowledge about the types of sewer systems, components of sewer systems, mechanisms of flow in sewer systems and the formula govern the flow in sewer systems. | Flow in Sewers | Lecture | Written exam |
| 3 |
| 4 | 6 | The students will learn how to design sanitary and storm sewer systems | Design of sewer systems | Lecture | Written exam |
| 5 |
| 6 | 3 | The students will have a knowledge about the pollutants of sanitary sewage and the processes of sewage treatment. | Treatment of Sanitary Sewage: General description | Lecture | Written exam |
| 7 | 3 | The students will learn how to design screening unit | Treatment of Sanitary Sewage: Screening unit | Lecture | Written exam |
| 8 | 6 | The students will learn how to design grit removal unit | Treatment of Sanitary Sewage: Grit removal unit | Lecture | Written exam |
| 9 |
| 10 | 3 | The students will learn how to design primary sedimentation unit | Treatment of Sanitary Sewage: Primary sedimentation unit | Lecture | Written exam |
| 11 | 6 | The students will learn how to design activated sludge system | Biological treatment of sewage by activated sludge system | Lecture | Written exam |
| 12 |
| 13 | 6 | The students will learn how to design trickling filters | Biological treatment of sewage by trickling filters | Lecture | Written exam |
| 14 |
| 15 | 3 | The students will learn how to design secondary sedimentation unit | Secondary sedimentation unit | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Steel, E. W. and McGhee, T. J., “Water supply and sewerage”, McGraw-Hill KOGAKUSHA, LTD, 1979. |
| 2. Key references (sources) | 1. Vissman, W., Hammer, M. and Perez, E. M., “Water supply and pollution control”, 8th Ed., Pearson Education Limited, 2014. 2. Mays, L. W., “Storm water collection systems design handbook”, The McGraw-Hill Companies, 2004. |
| A- Recommended books and references (scientific journals, reports ,.... | 1. Davis. M. L., “water and wastewater engineering”, McGraw-Hill Companies, Inc, 2010. |
| B- Electronic references, websites | Reputable websites.  Libraries sites in some international universities. |

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| 12. Course development plan |
| 1. Addition of processes relating to sludge treatment and reuse. 2. Give brief description for the methods of treated sewage reuse. |

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| Estimation is the art of estimating the quantities and construction paragraphs in terms of prices and construction period to the nearest reasonable number, usually before commencing work in order to allocate the expected financial amounts for its implementation.  Estimation is one of the basic tasks of the practicing engineer, through which estimates are made for the cost of construction works and projects. Therefore, the business owner or the project financier gives special importance to the accuracy of cost estimates because of their impact on determining the implementation of project decisions and working to provide the necessary amounts for them. For this reason, the estimated cost estimation processes are considered a source for testing the professional integrity of the engineer as well as the scientific competence of the engineer. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Estimation and engineering specifications |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 4th year |
| 6. Number of hours tuition (total) | 45 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * Estimation is the art of estimating the quantities and construction paragraphs in terms of prices and construction period to the nearest reasonable number, usually before commencing work in order to allocate the expected financial amounts for its implementation. * Estimation is one of the basic tasks of the practicing engineer, through which estimates are made for the cost of construction works and projects. Therefore, the business owner or the project financier gives special importance to the accuracy of cost estimates because of their impact on determining the implementation of project decisions and working to provide the necessary amounts for them. For this reason, the estimated cost estimation processes are considered a source for testing the professional integrity of the engineer as well as the scientific competence of the engineer. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- Clarify the basic concepts in calculating the quantities of construction materials.  A2- Acquisition of skills in dealing with problems and issues related to bills of quantities.  A3- Acquisition of basic skills as an introduction to estimating construction buildings.  A4 -Gain a basic understanding of how to accurately estimate various construction materials. |
| B. Subject-specific skills  B1 - The ability to understand the estimation mechanism and engineering specifications.  B2 - The ability to think about addressing a particular problem or issue.  B3 - Writing scientific reports.  B4 - The ability to gain experience in dealing with solving construction problems related to calculating the quantities of construction materials. |
| Teaching and Learning Methods |
| • Readings, self-learning, panel discussions.  • Exercises and activities in the lecture.  • Homework.  • Directing students to some websites to benefit and develop their capabilities.  • Conducting seminars to explain and analyze a specific issue and find solutions to it |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |
| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 3 |  | Guessing (introduction) | theory | Questions and discussion |
| 2 | 3 |  | Construction cost estimation | theory and tutorial | Questions and discussion and quiz |
| 3 | 3 |  | Detailed estimation | theory | Questions and discussion |
| 4 | 3 |  | Materials in the unit of measure for construction work | theory and tutorial | Questions and discussion and quiz |
| 5 | 3 |  | Materials in the unit of measure for construction work | theory | Questions and discussion |
| 6 | 3 |  | Ceramic wall covering | theory and tutorial | Questions and discussion |
| 7 | 3 |  | flatness | theory | Questions and discussion |
| 8 | 3 |  | Estimation the construction work paragraphs for buildings | theory | Questions and discussion and quiz |
| 9 | 3 |  | casting concrete foundations | theory and tutorial | Questions and discussion |
| 10 | 3 |  | wooden mold work | theory | Questions and discussion |
| 11 | 3 |  | Estimation of steel reinforcement quantities for foundations | theory | Questions and discussion |
| 12 | 3 |  | Estimating the quantities of steel reinforcement for the foundations | theory and tutorial | Questions and discussion |
| 13 | 3 |  | Casting bridges and roofs | theory | Questions and discussion and quiz |
| 14 | 3 |  | Casting bridges and roofs | theory | Questions and discussion |
| 15 | 3 |  | Box Culvert | theory and tutorial | Questions and discussion |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | 1. Conjecture and Specifications, Medhat Fadil Fathallah, revised fourth edition, 1985.  2. Calculating Quantities, M. Fawaz Muhammad Al-Qudah, Al-Balqa Applied University, Jordan, first edition, 2006.  3. Calculation of Quantities and Specifications, Eng. Ahmed Hussein Abu Odeh, Civil Engineering Series (1), Part One, Al-Balqa Applied University/College of Technological Engineering, Jordan, first edition, 2008.  4. Civil Engineering and Costing, S.P. Mahajan, 624. 1042, M214.  5. Estimating Building and Construction, 692.5, H816, 73-119. |
| 2. Key references (sources) | Engineering Estimation and costing -Journal |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites |  |

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| 12. Course development plan |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program. |

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| 1. Teaching Institution | University of Basrah |
| 2. University Department/Centre | Civil Engineering Department |
| 3. Course title/code | Engineering ethics |
| 4. Modes of Attendance offered | Class attendance or online |
| 5. Semester/Year | 2nd semester / 4th year |
| 6. Number of hours tuition (total) | 30 hrs |
| 7. Date of production/revision of this  specification | 2024 |
| 8. Aims of the Course | |
| * The course aims to enhance the ethics of engineers from a professional point of view from several axes, the most important of which is the religious and societal axis, considering that ethics is an acquired matter since childhood, in addition to linking these ethics to all work facilities (whether it is engineering or administrative) and the impact of the lack of a moral sense among the worker on the further development of countries due to Depletion of economic resources by administrative or engineering fraud, which leads to the failure of engineering projects that may lead to disasters that lead to the death of citizens. | |

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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |
| A- Knowledge and Understanding  A1- A study of the concept of professional ethics in its general, linguistic, and idiomatic sense, and the importance of these ethics.  A2- Knowing the history and development of ethical engineering codes and their interrelationship with each other.  A3- List some engineering disasters that occurred due to lack of professional ethics. |
| B. Subject-specific skills  B1 - Organize work well and avoid chaos that does not lead to harvesting its fruits.  B 2- Monitoring the work by providing a good system of supervision. |
| Teaching and Learning Methods |
| • The acquired professional ethics are reinforced by recalling Quranic verses or An Honorable Prophetic Hadith, or even mentioning some global examples of positive engineering profession codes and refining these ethics. |
| Assessment methods |
| • Interacting within the lecture.  • Homework and reports.  • Short exams (quizzes).  • Semester and final exams. |
| C. Thinking Skills  C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.  C2- Response: Follow up the student's interaction with the material displayed on the screen.  C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.  C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.  C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| Teaching and Learning Methods |
| • The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.  • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.  • The method of laboratory display using special devices for measuring the different properties of the substance under experiment. |

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| Assessment methods |
| • Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.  • Sudden exams during the theoretical and practical lecture.  • Quarterly exams for the theoretical and practical side.  • Final exams for the theoretical and practical side. |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Develop the student’s ability to perform the duties and deliver them on time  D2 - Logical and programmatic thinking to find programmatic solutions to various problems  D3 - developing the student's ability to dialogue and debate  D4 - Develop the student's ability to deal with modern technology, especially the Internet |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching  Method | Assessment  Method |
| 1 | 2 | 1st Lecture | Professional ethics concept | Lecture | Written exam |
| 2 | 2 | 2nd Lecture | Professional ethics concept | Lecture | Written exam |
| 3 | 2 | 3rd Lecture | General principles of professional ethics | Lecture | Written exam |
| 4 | 2 | 4th Lecture | General principles of professional ethics | Lecture | Written exam |
| 5 | 2 | 5th Lecture | Engineering Ethics | Lecture | Written exam |
| 6 | 2 | 6th Lecture | History of engineering blogs | Lecture | Written exam |
| 7 | 2 | 7th Lecture | History of engineering blogs | Lecture | Written exam |
| 8 | 2 | 8th Lecture | Engineering disasters | Lecture | Written exam |
| 9 | 2 | 9th Lecture | Examples of codes of ethics for the engineering profession | Lecture | Written exam |
| 10 | 2 | 10th Lecture | Examples of codes of ethics for the engineering profession | Lecture | Written exam |
| 11 | 2 | 11th Lecture | Examples of codes of ethics for the engineering profession | Lecture | Written exam |
| 12 | 2 | 12th Lecture | Examples of codes of ethics for the engineering profession | Lecture | Written exam |
| 13 | 2 | 13th Lecture | Examples of codes of ethics for the engineering profession | Lecture | Written exam |
| 14 | 2 | 14th Lecture | Institute of Electrical Engineers blog | Lecture | Written exam |
| 15 | 2 | 15th Lecture | Institute of Electrical Engineers blog | Lecture | Written exam |

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| 11. Infrastructure | |
| 1- Required reading:  · Books  · COURSE MATERIALS  · OTHER | Ethics of the engineering profession, author: Dr. Nabil Abdel Razzaq |
| 2. Key references (sources) |  |
| A- Recommended books and references (scientific journals, reports ,.... |  |
| B- Electronic references, websites |  |

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| 12. Course development plan |
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