

Ministry of Higher Education and Scientific Research  
Supervision and Scientific Evaluation Authority  
Department of Quality Assurance and Academic Accreditation

## Academic Program Description Form for Colleges and Institutes Academic Year

University: Shatt Al-Arab  
College/Institute: Engineering  
Scientific Department: Civil  
Date of Form Completion: 01/09/2025



Signature

Name of Head of Department:

Lecturer Nabeel Najm Abdullah



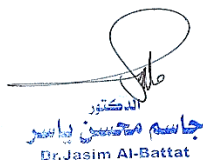
Signature

Name of Scientific Assistant

Dr. Jawad Kadhim

Reviewed by:  
Quality Assurance and University Performance Division  
Name of Division Director: Dr. Jasem Mohsen Yasser

Signature:



الدكتور  
جاسم محمد باقر  
Dr. Jasim Al-Battat



أ.م.د. احسان قاسم محمد  
عميد كلية الهندسة

Dean's Approval

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

| Module Information                 |                     |                               |                                                                                                                                                                                                                    |
|------------------------------------|---------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                     |                               |                                                                                                                                                                                                                    |
| Module Title                       | <b>Water Supply</b> |                               | Module Delivery                                                                                                                                                                                                    |
| Module Type                        | Core                |                               | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE417</b>        |                               |                                                                                                                                                                                                                    |
| ECTS Credits                       | 4                   |                               |                                                                                                                                                                                                                    |
| SWL (hr/sem)                       | <b>100</b>          |                               |                                                                                                                                                                                                                    |
| Module Level                       | 4                   | Semester of Delivery          | 2                                                                                                                                                                                                                  |
| Administering Department           | Type Dept. Code     | College                       | Type College Code                                                                                                                                                                                                  |
| Module Leader                      |                     | e-mail                        |                                                                                                                                                                                                                    |
| Module Leader's Acad. Title        |                     | Module Leader's Qualification |                                                                                                                                                                                                                    |
| Module Tutor                       |                     | e-mail                        |                                                                                                                                                                                                                    |
| Peer Reviewer Name                 | Name                | e-mail                        | E-mail                                                                                                                                                                                                             |
| Scientific Committee Approval Date | 1\9\2025            | Version Number                | 1.0                                                                                                                                                                                                                |

| Relation with other Modules       |                            |          |  |
|-----------------------------------|----------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                            |          |  |
| Prerequisite module               | Water supply and treatment | Semester |  |
| Co-requisites module              | None                       | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | <p>This module introduces the fundamental principles and engineering practices of water supply systems. It provides students with the knowledge required to estimate water demand, identify water sources, assess water quality, and design the main components of water supply systems, including intake structures, transmission pipelines, pumping stations, storage reservoirs, and water distribution networks. The course also covers conventional water treatment processes and relevant design standards to ensure the delivery of safe and reliable drinking water.</p>                                                                                                                                                                                                                                                                                                                                                              |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>Upon successful completion of this module, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the principles and components of water supply engineering systems.</li> <li>2. Estimate present and future water demand for communities.</li> <li>3. Evaluate different water sources and assess their suitability for potable water supply.</li> <li>4. Analyze water quality parameters and select appropriate treatment processes.</li> <li>5. Design intake structures, transmission mains, pumping stations, storage reservoirs, and water distribution networks.</li> <li>6. Apply hydraulic principles in the analysis and design of water supply systems.</li> <li>7. Use engineering standards and design codes in planning and designing water supply projects.</li> </ol>                                                                                                                            |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• Introduction to water supply engineering and public health considerations.</li> <li>• Water demand estimation and population forecasting.</li> <li>• Sources of water supply (surface water and groundwater).</li> <li>• Water quality standards and water quality analysis.</li> <li>• Water treatment processes: screening, aeration, coagulation, flocculation, sedimentation, filtration, and disinfection.</li> <li>• Design of intake structures and transmission pipelines.</li> <li>• Pumping stations and selection of pumps.</li> <li>• Service reservoirs and storage facilities.</li> <li>• Water distribution systems and network analysis.</li> <li>• Pipe materials, valves, fittings, and appurtenances.</li> <li>• Operation, maintenance, and management of water supply systems.</li> <li>• Design examples based on engineering standards and practical applications.</li> </ul> |
|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | Different teaching methods will be employed to achieve the course objectives, including lectures, classroom discussions, worked design examples, and problem-solving sessions. PowerPoint presentations and engineering design standards will be used to explain theoretical concepts and practical applications. Students will complete assignments and design exercises to strengthen analytical and engineering design skills. Regular participation in classroom activities and independent study of lecture notes are expected to enhance learning outcomes. |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                       |             |                  |               |                           |
|---------------------------------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
|                                                   |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                                                   | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                                                   | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                                                   | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                                                   | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>                           |                       |             | 100% (100 Marks) |               |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                                                                                      |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|                                                                   | <b>Material Covered</b>                                                                                              |
| <b>Week 1</b>                                                     | Introduction to Water Supply Engineering, objectives, components of water supply systems, and public health aspects. |
| <b>Week 2</b>                                                     | Water demand estimation, per capita consumption, demand variations, and population forecasting methods.              |
| <b>Week 3</b>                                                     | Sources of water supply: Surface water, groundwater, springs, and selection criteria.                                |

|               |                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------|
| <b>Week 4</b> | Water quality characteristics, physical, chemical, and biological parameters, and drinking water standards. |
| <b>Week 5</b> | .                                                                                                           |
| <b>Week 6</b> | Water intake structures and transmission systems.                                                           |
| <b>Week 7</b> | Water treatment processes: Screening, aeration, coagulation, and flocculation.                              |
| <b>Week 8</b> | Sedimentation and filtration processes in water treatment plants.                                           |
| <b>Week 9</b> | Disinfection methods, chlorination, and water treatment plant layout.                                       |

|                |                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------|
| <b>Week 10</b> | Pumping stations, pump selection, and hydraulic considerations.                                             |
| <b>Week 11</b> | Water storage reservoirs, balancing storage, and elevated tanks.                                            |
| <b>Week 12</b> | Water distribution systems, network layouts, and pipe materials.                                            |
| <b>Week 13</b> | Hydraulic analysis of water distribution networks and pressure management.                                  |
| <b>Week 14</b> | Design of water supply systems using engineering standards and design examples.                             |
| <b>Week 15</b> | Operation, maintenance, and management of water supply systems, including leakage control and water losses. |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                               |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                  |
|-------------------------------------------------------------------------|------------------|
|                                                                         | Material Covered |
| <b>Week 1</b>                                                           |                  |
| <b>Week 2</b>                                                           |                  |
| <b>Week 3</b>                                                           |                  |
| <b>Week 4</b>                                                           |                  |
| <b>Week 5</b>                                                           |                  |
| <b>Week 6</b>                                                           |                  |
| <b>Week 7</b>                                                           |                  |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                                                                                                                                             |                           |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                                                                                                                                                                                                        | Available in the Library? |
| <b>Required Texts</b>                                           | 1. Fundamentals of Behavioral Statistics, 1988, Peurifoy Robert L, and Ledbetter, William B. "Construction Planning, Equipment & Methods" 4th Edition, McGraw-Hill, 1985.<br>2. Nunnally, S. W. "Construction Methods and Management", 7th Edition, Upper Saddle River, New | Yes                       |

|                          |                                                                                                                                                                                          |    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                          | Jersey: Prentice Hall, 2007.<br>3. Dutta, B. N. “ Estimating and Costing in Civil Engineering-Theory and Practice”, 24th Edition, USB Publishers’ Distributors<br>Ltd., New Delhi, 1999. |    |
| <b>Recommended Texts</b> |                                                                                                                                                                                          | No |
| <b>Websites</b>          |                                                                                                                                                                                          |    |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks (%) | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A</b> - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                     |           |                                       |