

Course Description Form

1. Course Name: Fluid Mechanics

2. Course Code: CIV036

3. Semester / Year: First semester/2025

4. Description Preparation Date: 3/09/2025

5. Available Attendance Forms: Bologna system attendance form

6. Number of Credit Hours (Total) / Number of Units (Total): SSWL 122 + USSWL 53; ECTS 7

7. Course administrator's name (mention all, if more than one name)

Name: Zainab Naeem Ghazi

Email: zainab.naeem@uowa.edu.iq

8. Course Objectives

Course Objectives

1. Definitions of fluids: identify the key fluid properties used in the analysis of fluid mechanics, determine the dimensions and units of physical quantities such as viscosity and density.
2. Hydrostatics: calculate hydrostatic pressure distributions and pressure force on a submerged surface, calculate the buoyancy and determine the stability of floating bodies, calculate pressure variation in fluids undergoing rigid-body motion
3. Bernoulli equation: key assumptions, derivation, and application of static, dynamic, and total pressures.
5. Defining the continuity equation (the continuity equation) and its

| | |
|--|---|
| | <p>applications.</p> <p>6. Study the concept and mechanism of applying dimensional analysis.</p> <p>7. Calculating major and secondary losses.</p> <p>8. Hydraulic design of open channels.</p> <p>9. Internal flows: fully developed laminar and turbulent flows in a pipe, friction factor, Moody Chart, and head losses.</p> |
|--|---|

9. Teaching and Learning Strategies

| | |
|-----------------|--|
| Strategy | <p>This course offers different teaching and learning strategies. The teaching methodologies are represented by:</p> <ol style="list-style-type: none"> 1- Lectures where the information is presented throughout power point slides. 2- Oral discussions throughout the classes. Students are encouraged to be involved in these discussions. 3- Handouts are given to students on monthly-base. 4- Shore review at the beginning of the classes and short summary at the end of the classes. <p>The learning methodologies include:</p> <ol style="list-style-type: none"> 1- Encouraging students to solve questions in the textbooks. 2- Writing technical reports about different topics. |
|-----------------|--|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|-----------------|-------------------|
| 1 | 6 | 1 | Fluid Properties. | Lectures | Quizzes and HWs |
| 2 | 6 | 1 | Pressure variation in static fluid. Forces on plane surfaces. Forces on curved surfaces. | Lectures | Quizzes and HWs |

| | | | | | |
|----|---|---|--|----------|--------------------|
| 3 | 6 | 1 | Continuity equation. Energy equation (Ideal fluid) Mid-term Exam + Application of Energy equation. Application of Energy equation. Momentum equation. Dimensional analysis | Lectures | Quizzes and HWs |
| 4 | 6 | 1 | Fluid flow in pipes: Friction losses Fluid flow in pipes: Minor losses. Flow in open channels. | Lectures | Quizzes and HWs |
| 5 | 6 | 1 | Flow in open channels. Preparatory week before the final Exam | Lectures | Quizzes and HWs |
| 6 | 6 | 1 | | Lectures | Quizzes and HWs |
| 7 | 6 | 1 | | Lectures | Quizzes and HWs |
| 8 | 6 | 1 | | Lectures | Quizzes and HWs |
| 9 | 6 | 1 | | Lectures | Quizzes and HWs |
| 10 | 6 | 1 | | Lectures | Quizzes and HWs |
| 11 | 6 | 1 | | Lectures | Quizzes and HWs |

| | | | | | |
|----|---|---|--|----------|-----------------|
| 12 | 6 | 1 | | Lectures | Quizzes and HWs |
| 13 | 6 | 1 | | Lectures | Quizzes and HWs |
| 14 | 6 | 1 | | Lectures | Quizzes and HWs |
| 15 | 6 | 1 | | Lectures | Quizzes and HWs |
| 16 | 6 | 1 | | Lectures | Quizzes and HWs |

11. Course Evaluation

| | |
|-------------------|-----|
| Mid-term exam | 10% |
| HWs | 10% |
| Quizzes | 10% |
| Technical reports | 10% |
| Attendance sheet | 10% |
| Final Exam | 50% |

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | 1-Fluid Mechanics, Frank White, Fourth Edition, McGraw Hill, 1998 2-Fundamental of fluid mechanics, Munson, Young, Okiishi, Huebsch, Sixth edition, Willy, 2009 |
| Main references (sources) | Vennard J.k. and Street R.L.,(1982)"Elementary Flu Mechanics", John Wiley & Sons, New York (Six Edit |
| Recommended books and references (scientific journals, reports...) | journals, reports...) 1-Fluid Mechanics, Frank White, Fourth, Edition, McGraw Hill, 1998 2-Fundamental of fluid mechanics, Munson, Young, Okiishi, Huebsch, Sixth edition, Willy, 2009 |
| Electronic References, Websites | |