

# Steel Design I

## Course Description Form

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| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Steel Design I                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CIV41102                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3. Semester / Year:                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| First semester / fourth year                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1/10/2025                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| In class                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| The. 4 hr. / 5 Units                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Name: Mohammed Wasea Sabbar<br>Email: mohammed.w.sabbar@muc.edu.iq  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Course Objectives</b>                                            | Graduation of civil engineers qualified to work in their various fields of specialization:<br>1. Providing the student with the necessary skills and mechanisms to deal with the latest developments in scientific and technical progress in their field of specialization.<br>2. Special care for outstanding students and enabling them to put forward their ideas.<br>3. Providing the student with high skill and the ability to solve problems and teamwork.<br>4. Instilling the spirit of diligence and perseverance and encouraging them to create and innovate. |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Strategy</b>                                                     | <ul style="list-style-type: none"> <li>Introduce students to definition of structural steel design.</li> <li>Self-regulated learning (i.e., planning, monitoring and evaluating one's own learning process in the classwork / Class team work).</li> <li>Practice testing (short question answers and exams).</li> <li>Self-explanation (i.e., explaining to oneself how new information is related to old information or explain steps taken when solving a problem or a task).</li> </ul>                                                                              |

| 10. Course Structure |       |                                                                                                                                                                                                    |                                                    |                                                                                                                      |                                    |
|----------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Week                 | Hours | Required Learning Outcomes                                                                                                                                                                         | Unit or subject name                               | Learning method                                                                                                      | Evaluation method                  |
| 1.                   | 4     | Understanding the fundamentals of structural steel such as advantages, disadvantages, mechanical properties of steel, structural steel sections, specifications and design methods (ASD and LRFD). | Introduction to Structural Steel Design            | 1. Interactive Learning<br>2. Collaborative Learning<br>3. Technology-enhanced Learning<br>4. Problem-based Learning | Several Ways (Exams + Assignments) |
| 2.                   | 4     | Understanding and developing skills in adopting the AISC-360 design manual and specifications for structural design of different steel members.                                                    | AISC Specifications and Methods of Design          |                                                                                                                      | Several Ways (Exams + Assignments) |
| 3.                   | 4     | Students should be able to analysis and evaluate structural steel members adopted as tension members. Students should be able to design structural steel members adopted as tension members.       | Analysis of Tension members                        |                                                                                                                      | Several Ways (Exams + Assignments) |
| 4.                   | 4     |                                                                                                                                                                                                    | Analysis of Tension members                        |                                                                                                                      | Several Ways (Exams + Assignments) |
| 5.                   | 4     |                                                                                                                                                                                                    | Design of Tension members                          |                                                                                                                      | Several Ways (Exams + Assignments) |
| 6.                   | 4     |                                                                                                                                                                                                    | Design of Tension members                          |                                                                                                                      | Several Ways (Exams + Assignments) |
| 7.                   | 4     | 1- Students should be able to analysis and evaluate structural steel members adopted as axially loaded compression members (columns).                                                              | Introduction to Axially Loaded Compression Members |                                                                                                                      | Several Ways (Exams + Assignments) |
| 8.                   | 4     |                                                                                                                                                                                                    | Analysis of Axially Loaded Compression Members     |                                                                                                                      | Several Ways (Exams + Assignments) |
| 9.                   | 4     |                                                                                                                                                                                                    | Analysis of Axially Loaded Compression Members     |                                                                                                                      | Several Ways (Exams + Assignments) |

|     |   |                                                                                                                                            |                                                                                           |  |                                    |
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| 10. | 4 | 2- Students should be able to design structural steel members adopted as axially loaded compression members (columns).                     | Design of Axially Loaded Compression Members                                              |  | Several Ways (Exams + Assignments) |
| 11. | 4 |                                                                                                                                            | Design of Axially Loaded Compression Members                                              |  | Several Ways (Exams + Assignments) |
| 12. | 4 | 1- Students should be able to analysis and evaluate structural steel members                                                               | Introduction to Beams                                                                     |  | Several Ways (Exams + Assignments) |
| 13. | 4 |                                                                                                                                            | Design of Beams for Moments                                                               |  | Several Ways (Exams + Assignments) |
| 14. | 4 |                                                                                                                                            | Design of Beams for Moments                                                               |  | Several Ways (Exams + Assignments) |
| 15. | 4 | adopted as flexural members (beams).<br>2- Students should be able to design structural steel members adopted as flexural members (beams). | Design of Beams – Miscellaneous Topics (Unsymmetrical Bending and Design of Purlins etc.) |  | Several Ways (Exams + Assignments) |

#### 16. Course Evaluation

1. Final Exam: 60%
2. Monthly Exams: 15%
3. Reports and Assignments: 10%
4. Attendance and Daily Participation: 10%
5. Oral Evaluation: 5%

#### 17. Learning and Teaching Resources

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| Required textbooks (curricular books, if any)                      | 1- AISC Manual of Steel Construction, 15th Edition, 2017, American Institute of Steel Construction.<br>2-McCormac, J.C., "Structural Steel Design", 6th Edition, 2018. |
| Main references (sources)                                          |                                                                                                                                                                        |
| Recommended books and references (scientific journals, reports...) | 1- William T. Segui, "Steel Design", 5th Edition, 20<br>2- Spiegel, L and Limbrunner, G.F., "Applied Structural Steel Design", 4th Edition, 2002.                      |
| Electronic References, Websites                                    | <a href="https://www.aisc.org">https://www.aisc.org</a>                                                                                                                |