Course Description Form

1. Course Name:

Steel structure/ 2nd

2. Course Code:

Steel structure/ 2nd

3. Semester / Year:

(Course System)/2023-2024

4. Description Preparation Date:

20/3/2024

5. Available Attendance Forms:

Theoretical Classes

6. Number of Credit Hours (Total) / Number of Units (Total)

60 hrs./2

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

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Email: tabarak.hu@uowa.edu.iq

8. Course Objectives

Course Objectives	• **Introducing students to the basic principles of steel structure designs in civil engineering** • **Introducing students to the applications of steel structures in practice** • **The basics that are adopted in the analysis and design of the structural members of the steel structure** • **Identify the analysis and design of members exposed to tensile, compressive, bending and shear forces, as well as types of connection……**

9. Teaching and Learning Strategies

Strategy	• **Design and analysis of members exposed to tensile forces of steel sections and manufactured** • **Design and analysis of the members exposed to the compression forces (columns) of the steel sections of the processed and manufactured and as well as the design of the steel base for columns** • **Design and analysis of beams exposed to bending and shearing forces of the rigid steel sections** • **Design and analysis of beams and columns exposed to dual-bending, tensile** **or compressive forces of the steel sections** • **Design and analysis of types of fastening for steel sections (bonding using welding and bolts)** • **Knowing all the steel sections, their applications and specificatio**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
6-19	16	design of beam for moments, shear and deflection	Introduction, plastic behavior (zone1), beam weight estimates, design of beams -zone 1(full plastic moment), lateral supports of beams Inelastic buckling (zone 2), bending coefficients, moment capacities (zone2). Design of beams-zone3, elastic buckling (zone3), AISC Beam design charts, noncompact sections design for shear deflections, unsymmetrical bending, and design of purlins	Theoretical and analytical	
20-24	20	Bending and axial compression (beam-columns	Design of base plates for concentrically loaded columns, Bending and axial compression.		

			Beam Columns, first order and second order moments, analysis. effective length, approximate second order analysis method . magnification factors, moment modification factors, design of beam- columns in braced frames. design of be columns unbraced fran AISC-Part6 Tab and equivalent a load method.		
25-26	8	**Bolted connection**	joints, pretension joints, slip-critical joints, fully pretensioning methods, bearing type connections, slip-resistance connections shear strength and bearing strength for bearing type connections (load pass through center of gravity of connection). strength for critical connect (load pass thro center of gravit connection), s of bolt holes, l transfer, lap jo butt joint, failur bolted joints, minimum maximum		
27-28	8	**Eccentrically loaded bolted connections**	Bolts subjected to eccentric shear, Elastic analysis method, reduced eccentricity method, instantaneous center of rotation method AISC-Part7 Tab bearing-type connections subjected to sh and tension, critical connect subjected to sh and tension.		
29-30	8	**Welded connections**	Welding advantages, types of welding.		

			classification of welds, type of weld, type of joints, fillet welds, plug and slot welds, welding symbols, strength of welds, AISC requirements, size and length limitations of fillet welds, design of simple fillet welds, 8 strength of fillet welds loaded transversely, design of wel connections v both longituc and transverse f welds, design fillet welds for t members, stren of plug and welds.		

11. Course Evaluation

- **Oral examination during daily classes. (4/100)**
- **Joined discussions during lectures. (3/100)**
- **Attendance. (3/100)**
- **Monthly examinations (30/100)**
- **Mid-year examinations. (60/100)**

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	AISC Manual 15th edition Structural Steel Design 5th edition, Jack C. McCormac
Main references (sources)	AISC Manual 15th edition Structural Steel Design 5th edition, Jack C. McCormac
Recommended books and references (scientific journals, reports…)	William T. Segui "Steel Design", 6th Edition, 2018. McCormac, J.C., "Structural Steel Design", 6th Edition, 2018
Electronic References, Websites	William T. Segui "Steel Design", 6th Edition, 2018. McCormac, J.C., "Structural Steel Design", 6th Edition, 2018