

Republic of Iraq
Ministry of Higher
Education and Scientific
Research
Supervision and Scientific
Evaluation Apparatus



University: Shatt Al-Arab
College: Engineering
Department: Civil Engineering
Stage: 4th stage
Lecturer name: Dr. Jamal Abdulsamad
Academic title: Professor

Course Weekly Outline

Name	Dr. Jamal Abdulsamad Khudhair		
E-mail address	Jamal.Abdulsamad.Khudair@sa-uc.edu.iq		
Course name	Design of Steel Structures - 2		
Course objectives	1- Understanding the behaviour of beams in steel structures. 2- Learning the analysis and design of beams. 3- Studying the analysis and design of beam-column members. 4- Investigating the behaviour and design of bolted connection under the effect of concentric and eccentric loading. 5- Understanding the behaviour and design of welded connection.		
Course description	The course presents the fundamental knowledge of the structural behaviour of steel beams under loading, familiarizes students with the procedures used for the analysis and design of beams and beam-column members. The course also deals with different types of connections used in steel structures, bolted connections under concentric and eccentric loads are introduced, and behaviour of welded connections is investigated. The course has been prepared in accordance with the AISC specification-2016.		
References	1- AISC Steel Construction Manual, Fifteenth edition-2017. 2- Structural Steel Design.by McCormac and Csernak, 6th edition, 2018.		
External sources	Steel Design, by Segui, 6 th edition, 2018.		
Course assessment	Quizzes and assessment	Mid-term exam	Final exam
	40	10	50
General notes			

Republic of Iraq
Ministry of Higher
Education and Scientific
Research
Supervision and Scientific
Evaluation Apparatus



University: Shatt Al-Arab
College: Engineering
Department: Civil Engineering
Stage: 4th stage
Lecturer name: Dr. Jamal Abdulsamad
Academic title: Professor

Course Weekly Outline

College: Engineering

Department: Civil Engineering

Stage: 2nd stage

Lecturer name: Dr. Ihsan Qasim

Academic title: Assistant Professor

University: Shatt Al-Arab

Week No.	Theoretical	Aims
1	Design of Beams for Moments and shear: Introduction, Plastic behavior (zone1).	1- Understanding the structural behaviour of steel beams under loading. 2- Learning the procedures used for the analysis and design of beams and beam-column members. 3- Investigating the analysis and design of bolted and welded connections.
2	Plastic behavior (zone1). design of beams - zone1 (full plastic moment), lateral supports of beams,	
3	inelastic buckling (zone 2), bending coefficients, moment capacities (zone 2), design of beams – zone 3,	
4	elastic buckling,(zone 3), AISC beam design charts, noncompact sections	
5	Design for shear, unsymmetrical bending, and design of purlins.	
6	Bending and Axial Compression (Beam-Columns): Bending and axial compression, Beam – Columns, first order and second order moments, analysis	
7	effective length, approximate second order analysis method.	
8	magnification factors, moment modification factors.	
9	design of beam-columns in braced frames	
10	design of beam-columns in unbraced frames, AISC - Part6 Tables, and equivalent axial load method.	
11	Bolted Connections: Types of bolts, high - strength bolts, snug - tight joints, pretension joints, slip - critical joints, fully pretensioning methods, sizes of bolt holes, load transfer, lap joint, butt joint, failure of bolted joints,	
12	bearing type connections. shear strength and bearing strength for bearing type connections (load pass through center of gravity of connection).	

13	Eccentrically Loaded Bolted Connections: Bolts subjected to eccentric shear, Elastic analysis method, reduced eccentricity method, instantaneous center of rotation method.	
14	AISC - Part7 Tables, bearing - type connections subjected to shear and tension.	
15	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	