

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:

Asst. 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 ياسر
Dr. Jasim Al-Battat



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

Dean's Approval

Design of Steel Structures-2

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The model description provides a brief description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program.

1. Teaching Institution	Shatt Al-Arab University
2. University Department/Centre	Civil Engineering Department
3. Course title/code	Design of steel Structures-2
4. Modes of Attendance offered	Class attendance
5. Semester/Year	2nd semester / 4th year
6. Number of hours tuition (total)	60 hrs.
7. Date of production/revision of this specification	1-9-2025
8. Aims of the Course	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.

9• Learning Outcomes, Teaching, Learning and Assessment Method
A- Cognitive objectives A1- Understanding the behaviour of steel beams under loading. A2- - Knowledge of the behaviour of beam-column members A3- Understanding the analysis and design of bolted and welded connections. B- Skill objectives specific to the course. B1- provision of necessary skills to deal with steel structures. B2- Ability to analyze, beams, beam- column member, and connections B3- Knowledge of the procedures involved in designing beams, beam-column members, and connections. C. Thinking Skills C1- Analytical thinking: analyze steel structural members under different loading conditions. C2- Design thinking: develop efficient and economical steel structural designs that satisfy strength, and serviceability requirements. C3- Decision-making skills: choose of suitable steel grade and sections based on engineering judgment and standards.
Teaching and Learning Methods
•Theoretical lectures, discussion, and writing reports.

Teaching and Learning Methods
• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject. • The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.
Assessment methods
• Direct questions in a manner (how and why) for the subject during the lecture. • short exams during the theoretical lecture. • Midterm exam.
• Final exams.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Introduction to plastic behaviour of steel beams	Design of Beams for Moments and shear: Introduction, Plastic behavior (zone1).	Lecture and discussion	Direct questions
2	4	Understanding the procedure used for the design of beams in zone-1	Plastic behavior (zone1). design of beams - zone1 (full plastic moment), lateral supports of beams,	Lecture and discussion	Direct questions

3	4	Recognizing the behaviour of beams in the inelastic zone	inelastic buckling (zone 2), bending coefficients, moment capacities (zone 2), design of beams – zone 3,	Lecture and discussion	Short exam
4	4	Learning about the behaviour of beams in the elastic buckling zone	elastic buckling,(zone 3), AISC beam design charts, noncompact sections	Lecture and discussion	Direct questions
5	4	Knowing the procedure used for the design of beams for shear and under unsymmetrical bending	Design for shear, unsymmetrical bending, and design of purlins.	Lecture and discussion	Direct questions
6	4	Learning the behaviour of beams subjected to bending and axial compression. And introducing the concept of first order and second order analyses.	Bending and Axial Compression (Beam-Columns): Bending and axial compression, Beam – Columns, first order and second order moments, analysis	Lecture and discussion	Short exam
7	4	Performing the approximate second order analysis method.	effective length, approximate second order analysis method.	Lecture and discussion	Direct questions
8	4	Evaluation of magnification and moment modification factors.	magnification factors, moment modification factors.	Lecture and discussion	Midterm exam
9	4	Performing the design of beam – column in braced frame.	design of beam-columns in braced frames	Lecture and discussion	Direct questions
10	4	Performing the design of beam-columns in unbraced frames, AISC - Part6 Tables, and equivalent axial load method.	design of beam-columns in unbraced frames, AISC - Part6 Tables, and equivalent axial load method.	Lecture and discussion	
11	4	Learning the information necessary for the design of bolted connections.	Bolted Connections: Types of bolts, high - strength bolts, snug - tight joints, pretension	Lecture and discussion	Direct questions

			joints, slip - critical joints, fully pretensioning methods, sizes of bolt holes, load transfer, lap joint, butt joint, failure of bolted joints,		
12	4	Evaluation of the strength of bolted connections.	bearing type connections. shear strength and bearing strength for bearing type connections (load pass through center of gravity of connection).	Lecture and discussion	Direct questions
13	4	Learning about the behaviour of eccentrically loaded bolted connection.	Eccentrically Loaded Bolted Connections: Bolts subjected to eccentric shear, Elastic analysis method, reduced eccentricity method, instantaneous center of rotation method.	Lecture and discussion	
14	4	Familiarization with AISC-part7 Tables used for the design of bearing type connections.	AISC - Part7 Tables, bearing - type connections subjected to shear and tension.	Lecture and discussion	Short exam
15	4	Introducing basic information about the behaviour of welded connection	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	Lecture and discussion	

1- Required reading: · Books · COURSE MATERIALS · OTHER	1- AISC Steel Construction Manual, Fifteenth edition-2017. 2- Structural Steel Design.by McCormac and Csernak, 6th edition, 2018.
2. Key references (sources)	
A- Recommended books and references (scientific journals, reports ,....	Steel Design, by Segui, 6 th edition, 2018.
B- Electronic references, websites	

12. Course development plan
Adding new subjects to the curricula within the development of the course by no more than 5%. Adding new references