MODULE DESCRIPTION FORM- Steel Structures I

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Steel Structures I**	**Module Delivery**	
Module Type	Core	☐ Theory	
Module Code	**CIV023**	☒ Lecture	
ECTS Credits	**4**	☐ Lab	
		☒ Tutorial	
SWL (hr/sem)	**100**	☐ Practical	
		☐ Seminar	
Module Level	UGIV	**Semester of Delivery**	7
Administering Department	CV101	**College**	Civil Engineering College
Module Leader	Dr. Sheelan Mahmoud Hama	**e-mail**	drsheelan@uoanbr.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Mohammed Raji Mohammed	**e-mail**	moh.raji@uoanbar.edu.iq
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introduce to the students, the principal types of steel structures 2. Provide the students with a basic understanding of the essential steps involved in the design of steel structures. 3. Develop an understanding of the behavior of steel structures under different types of loading 4. Perform basic analyses to solve problems related to steel structures with the given procedures, and understand their limitations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify various loading conditions that are important in structural design and determine/select the critical loading. 2. Perform the appropriate structural analysis based on the loading determined above and design the overall structure, determining the required member sizes capable of supporting the loads. 3. Apply the knowledge they acquired in the prerequisite courses such as determining maximum moments and forces and finding the strength of each member. 4. To design all connections, which are integral parts of the overall structure based on forces and moments found in the previous steps.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Chapter one Introduction: General, Advantages and disadvantages of steel structures, Materials, Type of Structural Steel Sections, Cross-Sections of Some of the more Commonly Used Hot-Rolled Shapes, Loads, Philosophies of Design, and Building Codes. [4 hrs] Chapter two Specifications, Loads, and Methods of Design: Specifications and Building Codes, Loads, Load and Resistance Factor Design (LRFD) and Allowable, Strength Design (ASD), Nominal Strengths, Computation of Loads for LRFD and ASD, Computing Combined Loads with LRFD Expressions, Computing Combined Loads with ASD Expressions, Two Methods of Obtaining an Acceptable Level of Safety Discussion of Sizes of Load Factors and Safety Factors. [4 hrs]

	Chapter Three Analysis of Tension Members: Introduction, Nominal Strengths of Tension Members, Net Areas, Effect of Staggered Holes, Effective Net Areas, Connecting Elements for Tension Members, Block Shear. [8 hrs] Chapter Four Design of Tension Members: Selection of Sections, Built-Up Tension Members [8 hrs] Chapter Five Compression members: General, Residual Stresses, Sections Used for Columns, Development of Column Formulas, The Euler Formula, End Restraint and Effective Lengths of Columns, Stiffened and Unstiffened Elements, Long, Short, and Intermediate Columns, Column Formulas, Maximum Slenderness Ratios, Design of [16 hrs] Chapter Six Axially Loaded Compression Members: Introduction, AISC Design Tables, Frames Meeting Alignment Chart Assumptions, Frames not Meeting Alignment Chart Assumptions as to Joint Rotations, Stiffness-Reduction Factors, Columns Leaning on Each Other for In-Plane Design. [16 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Steel structures courses require effective learning and teaching strategies to ensure students develop a strong understanding of complex concepts and their practical applications. The range of strategies that can enhance the learning experience for students in steel structures courses. These strategies include lecture-based teaching, practical applications, problem-solving assignments, group work and discussions, technology integration, field trips and site visits, guest speakers, assessments and feedback, continuous learning, and encouraging self-directed learning. By incorporating these strategies, educators can create an engaging and comprehensive learning environment that equips students with the knowledge, skills, and critical thinking abilities necessary for success in the field of steel structures design and analysis.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.0
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.0
Total SWL (h/sem)	125		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3, 6,10,14	LO #1, 3, and 4
	Assignments	2	5% (5)	2, 12	LO # 2 and 3
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 2,3 and 4
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-4
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction: General, Advantages and disadvantages of steel structures, Materials, Type of Structural Steel Sections, Cross-Sections of Some of the more Commonly Used Hot-Rolled Shapes, Loads, Philosophies of Design, and Building Codes.
Week 2	Specifications, Loads, and Methods of Design: Specifications and Building Codes, Loads, Load and Resistance Factor Design (LRFD) and Allowable, Strength Design (ASD), Nominal Strengths, Computation of Loads for LRFD and ASD, Computing Combined Loads with LRFD Expressions, Computing Combined Loads with ASD Expressions, Two Methods of Obtaining an Acceptable Level of Safety, Discussion of Sizes of Load Factors and Safety Factors.
Week 3	Analysis of Tension Members : Introduction, Nominal Strengths of Tension Members , Net Areas ,Effect of Staggered Holes , Effective Net Areas ,
Week 4	Connecting Elements for Tension Members, Block Shear .
Week 5	Selection of Sections,
Week 6	Built-Up Tension Members.
Week 7	Compression members: General, Residual Stresses, Sections Used for Columns, Development of Column Formulas, *
Week 8	The Euler Formula, End Restraint and Effective Lengths of Columns,
Week 9	Stiffened and Unstiffened Elements,
Week 10	Long, Short, and Intermediate Columns, Column Formulas,
Week 11	Maximum Slenderness Ratios, example problems.
Week 12	Design of Axially Loaded Compression Members: Introduction, AISC Design Tables

Week 13	Frames Meeting Alignment Chart Assumptions
Week 14	Frames not Meeting Alignment Chart Assumptions as to Joint Rotations
Week 15	Stiffness-Reduction Factors, Columns Leaning on Each Other for In-Plane Design
Week 16	**The preparatory week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• McCormac, Jack C.-Structural steel design-(2018) • William T. Segui. Steel Design, 6th ed, 2018	No
Recommended Texts	• (15th) AISC - Steel Construction Manual 15th Edition-AISC (2017)	Yes
Websites	https://www.uoanbar.edu.iq/Bank-Section.php	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.