



Course Syllabus

**According to JORDAN National Qualification
Framework (JNQF)**

**Course Name: Structures Mechanics
for Architecture**

Course Number: 0403225

General Course Information:

Course title	Structures Mechanics for Architecture –
Course number	(0403225)
Credit hours	Three credit hours
Education type	Face-to-Face
Prerequisites/corequisites	1102181 – Calculus I, 1102101 - Physics I
Academic Program	BSc in Architect Engineering
Program code	0403
Faculty	Engineering
Department	Civil Engineering
Level of course	Bachelor
Academic year /semester	First semester 2022/2023
Awarded qualification	BSc
Other department(s) involved in teaching the course	Non
Language of instruction	English
Date of production/revision	Oct. /2021

Course Coordinator:

Coordinator's name	Dr. Reema Al-dalain
Office No	4213 Engineering Building
Office Phone extension number	2483
Office Hours	11:00-12:00 Sunday, Tuesday, and Thursday, 01:00-02:00 Monday and Wednesday
Email	Reema.aldalaeen@iu.edu.jo

Other Instructors:

Instructor name	NON
Office No	
Office Phone extension number	
Office Hours	
Email	

Course Description(English/Arabic):

English	Introduction, Two and three dimensional force systems, components, resultants, moments and couples, equilibrium, structures (trusses, frames, machines), distributed load (center of gravity, center of mass, centroid), shear force and bending moment in beams, moments of inertia. Relation between external forces and internal stress
Arabic	أنواع المنشآت، الأحمال، الثبات والتقارير، ردود الفعل، القوى الداخلية في المنشآت المقررة استاتيكية: القوى المحورية، عزوم الانحناء، اللي وقوى القص في الجيزان، الإطارات ذوات العناصر المستقيمة والمنحنية، الشبكيات والمنشآت الفراغية، خطوط التأثير للجيزان والإطارات والشبكيات المستوية. طرق ترخيم المنشآت،

Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

Structural Analysis, R.C. Hibbeler, Eighth Edition, SI units, ISBN 978-981-06-8713-7, Published by Prentice-Hall, Inc.

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

Required book (s), assigned reading and audio-visuals:

1. "Elementary Structural Analysis", C. H. Norris, J. B. Wilbur, and S.Utku, Third Edition, McGraw Hill, ISBN 0-07-047256-4.
2. "Structural Analysis", Aslam Kassimali, 2nd Edition, PWS Publishing. ISBN 0-534-95324-7.

Course Educational Objectives (CEOs):

1.	Provide a thorough understanding and practical applications of structural analysis theories
2.	Develop the skills to analyze and understand the behavior and response of structures to various loads and constraints.
3.	Establish foundation knowledge and skills through structural analysis in preparation for structural design; concrete, steel and other structural materials.

Intended Learning Outcomes (ILO's):

	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
A	Knowledge and Understanding:				
A1	Define basic structural engineering terminology; Distinguish between stable and unstable and statically determinate and indeterminate structures; and compute the support reactions.	1,2	1	1,2	K
B	Intellectual skills:				
B1	Analyze statically determinate trusses under various loading conditions and determine the internal forces in each truss member.	1,2,3	1	2,3&4	S
B2	Determine internal forces (axial, shear), and moment in beams and frames using equilibrium and	1,2,3	1	2,3&4	S

	equations and be able to draw axial, shear and moment diagrams.				
C	Subject specific skills:				
C1	Determine maximum values of stress functions; reactions at supports, and internal forces and moments at different sections of structural elements due to moving static loads.	1,2,3	1,7	2,3&4	S & C

***Bloom Taxonomy Levels**

Level#	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (BSc in civil engineering) program will demonstrate:	Descriptors**		
	K	S	C

1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	K		
2.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors			C
3.	An ability to communicate effectively with a range of audiences		S	
4.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			C
5.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives		S	
6.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions		S	
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	K		C

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule (please choose the type of teaching)

Face to Face

Hybrid (2 Lectures Face – To - Face + 1 Lecture Asynchronous)

Hybrid (1 Lectures Face – To - Face + 1 Lecture Asynchronous)

Online (2 Lectures Synchronous + 1 lecture Asynchronous)

Week	First Lecture (Monday)	Second Lecture (Wednesday)	Ach. ILOs	Ach. PLOs	Descriptors**
1	Introduction	Classifications of structures and loads Equilibrium, superposition and determinacy	A1	1	K
2	Classifications of structures and loads Equilibrium, superposition and determinacy	Classifications of structures and loads Equilibrium, superposition and determinacy	A1	1	K
3	Truss analysis	Truss analysis	B1	1	S
4	Truss analysis (compound and space trusses)	Truss analysis (compound and space trusses)	B1	1	S

5	Internal loadings in structural members (beams)	Internal loadings in structural members (beams)	B2	1	S
6	Internal loadings in structural members (beams)	Internal loadings in structural members (beams)	B2	1	S
7	Frame analysis	Frame analysis	B2	1	S
8	Frame analysis	Frame analysis	B2	1	S
9	Influence lines for Determinate structures	Influence lines for Determinate structures	C1	1	S& C
10	Influence lines for Determinate structures	Influence lines for Determinate structures	C1	1	S& C
11	Deflection methods (Integration)	Deflection methods (Integration)	C1	1	S& C
12	Deflection methods (conjugate beam)	Deflection methods (conjugate beam)	C1	1	S& C
13	Deflection methods (moment area)	Deflection methods (moment area)	C1	1	S& C
14	Deflection methods (strain energy, Castigliano's theorems, and virtual work)	Deflection methods (strain energy, Castigliano's theorems, and virtual work)	C1	1	S& C
15	Deflection methods (strain energy, Castigliano's theorems, and virtual work)	Deflection methods (strain energy, Castigliano's theorems, and virtual work)	C1	1	S& C

* K: Knowledge, S: Skills, C: Competency

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Face to face lectures
- Discussion Forums
- Homework
- Quizzes

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20 %**
- Midterm **30%**
- Final Exam **50 %**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required equipment:

- PC / Laptop
- Access to the IU E-Learning Platform at: <https://elearn.iu.edu.jo/>
- [E-learning plan](#)
- [Satisfaction questionnaires for online and face-to-face learning](#)
- [Software for e-learning](#)

Assessment Tools implemented in the course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Discussion Forums

Responsible Persons and their Signatures:

Course Coordinator	Dr. Reema Al-dalain	Completed Date	1 /10/2022
		Signature	
Received by (Department Head)		Received Date	
		Signature	