



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

**Course Name: Special Topics**

**Course Number: 04035273**

## General Course Information:

Course title	Special Topics
Course number	04035273
Credit hours	3
Education type	[Face-to-Face]
Prerequisites/corequisites	
Academic Program	Civil engineering
Program code	40
Faculty	Engineering
Department	Civil engineering
Level of course	Bachelor
Academic year /semester	2022/2023, First semester
Awarded qualification	B.Sc
Other department(s) involved in teaching the course	None
Language of instruction	English
Date of production/revision	2-10-2022

## Course Coordinator:

Coordinator's name	Dr. Ethar al Essa
Office No	4208
Office Phone extension number	
Office Hours	Sun. (9-11 PM + 1-2 PM), Mon. (11:-12:30 PM), Tue. (9-11 PM + 1-2 PM), Wed. (11:-12:30 PM), and Thu. (9-10 PM)
Email	ethar.alessa@iu.edu.jo

## Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

## Course Description (English/Arabic):

English	<i>This course presents an introduction to the field of three topics related to water and environment. These are: water status in Jordan, wastewater and nanotechnology, desalination and hazardous waste. In addition, the risk assessment.</i>
Arabic	<i>يقدم هذا المساق مقدمة في مجال ثلاثة مواضيع تتعلق بالمياه والبيئة. هذه هي: حالة المياه في الأردن ، مياه الصرف الصحي وتكنولوجيا النانو ، تحلية المياه والنفايات الخطرة. بالإضافة إلى ذلك ، تقييم المخاطر.</i>

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

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

1.	Davis, M.L. and Cornwell, D.A. (2008) Introduction to environmental engineering, McGraw-Hill. 5th Edition, Pearson, USA.
2.	El-Dessouky, H.T. and Ettouney, H.M. (2002) Fundamentals of salt water desalination, Elsevier.

**Course Educational Objectives (CEOs):**

1.	Understand the basic principles of water status with a focus on the climatic and hydrological characteristics of Jordan
2.	Learn the concept of wastewater treatment with nanotechnology
3.	Learn the concept of sea water desalination, and be able to design and do some calculations.
4.	Study the hazardous wastes and the required strategy to manage them
5.	Learn the concepts of Risk assessment

**Intended Learning Outcomes (ILO's):**

1.	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**
2. A	<b>Knowledge and Understanding:</b>				
3. A1	To learn the fundamental aspects related to the wastewater treatment with nanotechnology. focusing on the estimation of quantity of water in the environment. In addition, to learn the methods used for the sea water desalination.	1,2	1,2	1,2	K, C
4. A2					
5. A3	To learn the principles of reverse Osmosis Performance . as well, to learn the concepts of hazardous waste and their management and the risk assessment (a,f)	4,5	1,6	1,3	K , S
6. A4					
7. B	<b>Intellectual skills:</b>				
8. B1					
9. B2					
10. B3					
11. C	<b>Subject specific skills:</b>				
12. C1					
13. C2					
14. C3					

<b>15. D</b>	<b>Transferable skills:</b>				
<b>16. D1</b>					
<b>17. D2</b>					
<b>18. D3</b>					

**\*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 ( _____ ) 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**

**Asynchronous)**

Week	First Lecture (.....)	Second Lecture (.....)	Ach. ILOs	Ach. PLOs	Descriptors**
1	introduction	Water challenging in Jordan and suggested solutions.			

2	Water quality,	Water quality,			
3	Water and health,	drinking water regulations			
4	Advanced Wastewater treatment (introduction)	Advanced Wastewater treatment with nanotechnology			
5	Advanced Wastewater treatment with nanotechnology	Advanced Wastewater treatment with nanotechnology			
6	Definition of desalination	understanding the concept of osmosis			
7	Definition of reverse osmosis	understanding the concept of reverse osmosis			
8	Reverse Osmosis Performance	Principles of RO operating			
9	Reverse Osmosis, Design Calculations	Reverse Osmosis, Design Calculations			
10	Reverse Osmosis advantage and disadvantage	Reverse Osmosis advantage and disadvantage			
11	Hazardous waste- Introduction	Definition and classification			
12	RCRA, HSWA	, CERCLA and SARA			
13	Hazardous Waste Management	Land Disposal			
14	Risk Assessment (introduction)	Concepts of Risk assessment			
15	Seminar presentation	Seminar presentation			

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

### Teaching Methods and Assignments:

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

- Interactive videos
- Practice Labs
- Discussion Forums
- Quizzes
- Other Interactive online activities
- Reports

## 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 with webcam and mic**
- **Internet Connection**
- **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
- Training

## Assessment Tools implemented in the course:

- **Final Exam**
- **Midterm Exam**
- **Quizzes**
- **Homework**
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others:.....

## Responsible Persons and their Signatures:

<b>Course Coordinator</b>		<b>Completed Date</b>	/ /
		<b>Signature</b>	

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<b>Received by</b> (Department Head)		<b>Received Date</b>	/ /
		<b>Signature</b>	