جامعة الإسراء
ISRA UNIVERSITY

COURSE Syllabus
According to JNQF

Course Name: Railroad & Airport Engineering

Course Number: 04035162

General Course Information:

Course title	Railroad & Airport Engineering
Course number	04035162
Credit hours	3 hours (theory)
Contact hours	3 hours (theory)
Prerequisites/corequisites	Pavement Design (403440)
Academic Program	Civil Engineering
Program code	03
Awarding institution	Isra University
Faculty	Engineering
Department	Civil engineering
Level of course	4rd year level
Academic year /semester	Second Semester 2021-2022
Awarded qualification	B.Sc
Other department(s) involved in teaching the course	-
Language of instruction	English
Date of production/revision	2021/2022

Course Coordinator: Dr.Eng. Hussein Saraireh

Coordinator's Name: Dr. Eng. Hussein Saraireh
Office No.: 4308
Office Phone: 2502
Office Hours: 9 hours/ Sunday 9-11, Tuesday 10-12, Thursday 9-12: 10:00-12:30 and Monday 14-15, Wednesday: 14.00-15.00
Email: huussein.saraireh@iu.edu.jo

Other Instructors:

Instructor's Name:
Office No.:
Office Phone:
Office Hours:
Email:

Course Description *(English/Arabic)*:

English	• Airport Engineering: investigation of airport location and requirements. Design of runways: orientation, lengths, and cross-sections. Design and requirements of airport terminals. • Railroad engineering: cross-sections, intersection design of horizontal and vertical curves of railroad. The course includes a term project submitted by the end of the semester.

Arabic	

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

Course readings are selected from a variety of books, journals, articles, case studies and manuals. However, there is a text book and a manual that are recommended for a more in-depth understanding of the subject:

Railroad Engineering:

- Railroad Engineering (Second Edition), William W. Hay, John Wiley and Sons, New York, 1982, 1982, ISBN 0-471-36400-2.
- Practical Guide for Railroad Engineering by AREMA (AREMA – American Railway Engineering and Maintenance-of-Way Association)

Airport Engineering:

- Planning and Design of Airports, Robert Horonjeff, Francis X. McKelvey, William J. Sproule, Seth B. Young: Fifth Edition, 2010 McGraw-Hill Companies.

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

- AREMA, Manual for Railway Engineering, 2000 (and later)
- U.S. Army Corps of Engineers, Railroad Design and Construction, Technical Instruction TI 850-02, 2000

Course Educational Objectives (CEOs):

1.	Apply fundamental knowledge of transportation engineering of Railroad and Understand the Design Standards of Railroads.
2.	Apply fundamental knowledge of transportation engineering of Airports and Understand the Design Standards of Airports.
3.	Understand the appropriate Computer tools to design of Railroad and Airport Facilities
4.	Work effectively in teams to develop solutions to Railroad and Airport Design of Facilities problems.

Intended Learning Outcomes (ILO's):

1.	Intended Learning Outcomes (ILO's)	**Relationship to CEOs**	**Contribution to PLOs**
2. A	Knowledge and Understanding:		
3. A1	Understand the Design Standards of Railroad and Airport Facilities, Design of Horizontal and Vertical Alignment.	3	2,3
4. A2			
5. A3			

6. B	Intellectual skills:		
7. B1	Apply fundamental knowledge of transportation engineering of Railroad and Airport	1,2	2,3
8. B2	Apply the appropriate Computer tools to design of Railroad and Airport Facilities	1,2	1
9. B3			
10. C	Subject specific skills:		
11. C1			
12. C2			
13. C3			
14. D	Transferable skills:		
15. D1	Work effectively in teams to develop solutions to Railroad and Airport Design of Facilities problems.	4	4
16. D2			
17. D3			

Weekly Schedule *(please chose the type of teaching)*

☐ *(**3 hrs** Face – To - Face)*

☐ *(**2 hrs** Face – To - Face **+1 hr** Asynchronous)* **(Hybrid)**

☐ *(**3 hrs** Online)*

Week	First Hour (……..)	Second Hour (……..)	Third Hour (……..)	Ach. ILOs	Ach. PLOs	Descriptors*
1	Introduction to railways			A1, B1		K
2	Track gauge and alignment			A1, B1		K & S
3	Ballast, fitting and fastening			A1, B1		K & S
4	Subgrade and formation			A1, B1		K
5	Geometric design of tracks			A1, B1, D1		K & C
6	Introduction to airport engineering			A1, B2		k
7	Aircrafts			A1, B2		K
8	Geometric design of the airfield			A1, B2		K & S

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

Teaching Methods and Assignments:

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

- Lectures
- (3 hrs Face – To - Face)
- (2 hrs. Face – To - Face +1 hr Asynchronous) (Hybrid)
- Discussion Forums
- Quizzes
- Other Interactive online activates

Course Policies:

A- Attendance policies:

15% of 48 lecturing hours

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- Health and safety procedures: NA

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,** Software, Java and C#

Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to Online Compiles such as:**
  Access to the IU E-Learning Platform at: https://elearn.iu.edu.jo/

- **Software (Microsoft Excel), AutoCAD, Civil3D**

Assessment Tools implemented in the course:

i. Midterm Exam.
ii. Final Exam.
iii. Quizzes.
iv. Homework.

v. Participation in Lecture.

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		Bloom Taxonomy Levels*
a	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	
b	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	An ability to communicate effectively with a range of audiences.	
d	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.	
e	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.	
f	An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.	
g	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	

***Bloom Taxonomy Levels**

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

Responsible Persons and their Signatures:

Course Coordinator	**Dr.Eng. Hussein Saraireh**	**Completed Date**	/ /
		Signature	

Received by (Department Head)	**Dr. Ibrahiem Varouqa**	**Received Date**	/ /
		Signature	