The University of Jordan
School of Engineering
Industrial Engineering Department
Second semester 2024/2025

Course name:	Research methods for engineering
Course code:	0916302
Credits hours	2 hr.
Contact hours& room	**09:00-10:00 Tuesday, and Wednesday (Microsoft Team)** **09:20-10:00 Tuesday, and Wednesday (Microsoft Team) Ramadan Time** 2UJ2024 RESEARCH METHODS FOR ENGINEERING Section 1 | General | Microsoft Teams
Office hours	**Office hours:** **10:00-10:15 (Online) Monday and Wednesday** **12:30 – 13:30 (in person) Sunday, Tuesday, and Thursday.**
Course instructor's name, E-mail, and phone:	Prof. Dr. Mohammad D. AL-Tahat altahat@ju.edu.jo Phone: 22933
Course Coordinator:	
Textbook:	Sekaran, U., & Bougie, R. (2016). Research Methods For Business: A Skill Building Approach (7th ed.). Wiley Global Education US. Or Sekaran, U., & Bougie, R. (2019). Research Methods For Business: A Skill Building Approach (8th ed.). Wiley Global Education US.
Other reference(s):	• Recorded videos on Microsoft team
Course Description:	As stated in the approved study plan. The nature and types of research and their characteristics. Survey research, the definition of the research problem and its statement, its theoretical framework and develop hypotheses related to the research, design elements, in addition to the classification of different variables. Methods of sampling, analysis, quantitative and qualitative research data, achieving results, writing research reports, in addition to the submission and the presentation of the research.
Providing Department:	Industrial Engineering
Prerequisite Course:	0916356
Course type	Required (Mandatory)

Assessment Methods:

Method	Weight %	Date
Project, General Activities and Quizzes	30	
Mid Exam (Online)	30	Will be determined later
Final Exam (Online)	40	Will be determined later

Course Learning Outcomes:

#	After successful completion of this course, the student will be able to	SO		
CLO1	Describe and define engineering research.	3		Mid Exam
CLO2	Know the characteristics of scientific research	3		
CLO3	Discuss the steps involved when conducting scientific research	3		
CLO4	Develop the problem statement	3		
CLO5	Develop the research proposal	3		
CLO6	Document a literature review	3		
CLO7	Describe some of the databases useful for research	3		
CLO8	Develop a theoretical framework for scientific research.	3	**6**	

	CLO9	Develop hypotheses	3		
	CLO10	Develop an appropriate research design for any given study.	3		
	CLO11	Describe some of the nonexperimental data collection approaches, interviews, observations, questionnaires.	3		

Week #	Topic
1	Course Orientation and Syllabus Discussion Introduction to research Types of business research: applied and basic Managers and research Internal versus external consultants/researchers Ethics and business research
2	The scientific approach and alternative approaches to investigation The hallmarks of scientific research The seven-step process in the hypothetico-deductive method Alternative approaches to research
4	Defining and refining the problem The broad problem area Defining the problem statement The research proposal Managerial implications Ethical issues in the preliminary stages of investigation
6	The critical literature review. How to approach the literature review Some online resources and databases useful for business research Referencing and quotation in the literature review section
8	Theoretical framework and hypothesis development Variables Theory generation Hypothesis development
10	Elements of research design The research designs. Elements of research design Extent of researcher interference with the study Study setting: contrived and no contrived. Unit of analysis Time horizon
12	Non-experimental data collection methods: Interviews
14	Non-experimental data collection methods: Observations
15	Non-experimental data collection methods: Questionnaires
16	**Final Examinations**

Important Notes:

a. Do not hesitate to ask questions.
b. You are required to bring a notebook and take notes in classes.
c. Students are expected to attend every class session and they are responsible for all material, announcements, schedule changes, etc., discussed in class.
d. Discuss the assignments among yourselves.
e. Don't Cheat; direct copying of others work will NOT be allowed or tolerated and will result in a reduction of grade. If you are found to be cheating in any way, on an exam or assignment, even signing the roll sheet for another student, you will be given an "F" for the course. There will be no exceptions.

	f. All cases of academic dishonesty will be handled in accordance with university policies and regulations. JU policy requires the faculty member to assign ZERO grade (F) if a student misses 15% of the classes that are not excused, and 20% of the classes that are excused. g. Students are expected to be ready to take a quiz any time they have a class. There will be no make-up quizzes or homework. h. Any students with disabilities who need accommodations in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements for these accommodations.

The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)	
1	*an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
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*
3	*an ability to communicate effectively with a range of audiences*
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*
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*
6	*an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7	*an ability to acquire and apply new knowledge as needed, using appropriate learning strategies*