University of Jordan
School of Engineering
Civil Engineering Department

Scientific Research Methodology (0901748)
Syllabus

Spring 2018/2019

Instructor:
Dr. Rabab Allouzi (r.louzi@ju.edu.jo)

Office Hours:
Sunday and Thursday 2:30 pm – 3:30 pm
Monday and Wednesday: 11 AM-12:30 PM

REFERENCES:

GRADING SYSTEM:
Mid Exam (40%)
Project (20%)
Final Exam (40%)
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<td><strong>Research Methodology: An Introduction</strong>  &lt;br&gt;Objectives of Research  &lt;br&gt;Motivation in Research  &lt;br&gt;Types of Research  &lt;br&gt;Research Approaches  &lt;br&gt;Significance of Research  &lt;br&gt;Research Methods versus Methodology  &lt;br&gt;Research and Scientific Method</td>
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<td>3-4</td>
<td><strong>Defining the Research Problem</strong>  &lt;br&gt;Selecting the Problem  &lt;br&gt;Necessity of Defining the Problem  &lt;br&gt;Technique Involved in Defining a Problem</td>
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<td>7-8</td>
<td><strong>Sampling Design</strong>  &lt;br&gt;Census and Sample Survey  &lt;br&gt;Implications of a Sample Design  &lt;br&gt;Steps in Sampling Design  &lt;br&gt;Criteria of Selecting a Sampling Procedure  &lt;br&gt;Characteristics of a Good Sample Design  &lt;br&gt;Different Types of Sample Designs  &lt;br&gt;How to Select a Random Sample?  &lt;br&gt;Random Sample from an Infinite Universe  &lt;br&gt;Complex Random Sampling Designs</td>
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<td>9-11</td>
<td><strong>Methods of Data Collection</strong>  &lt;br&gt;Collection of Primary Data  &lt;br&gt;Observation Method  &lt;br&gt;Interview Method  &lt;br&gt;Collection of Data through Questionnaires  &lt;br&gt;Collection of Data through Schedules  &lt;br&gt;Difference between Questionnaires and Schedules  &lt;br&gt;Some Other Methods of Data Collection  &lt;br&gt;Collection of Secondary Data  &lt;br&gt;Collection of Primary Data  &lt;br&gt;Observation Method  &lt;br&gt;Interview Method  &lt;br&gt;Collection of Data through Questionnaires  &lt;br&gt;Collection of Data through Schedules  &lt;br&gt;Difference between Questionnaires and Schedules  &lt;br&gt;Some Other Methods of Data Collection  &lt;br&gt;Collection of Secondary Data</td>
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| 11-12 | **Processing and Analysis of Data**  
| **Processing Operations**  
| **Some Problems in Processing**  
| **Elements/Types of Analysis**  
| **Statistics in Research**  
| **Measures of Central Tendency**  
| **Measures of Dispersion**  
| **Measures of Asymmetry**  
| **Measures of Relationship**  
| **Simple Regression Analysis**  
| **Multiple Correlation and Regression**  
| **Partial Correlation** |
| **What is a Hypothesis**  
| **Basic Concepts Concerning Testing of Hypotheses**  
| **Procedure for Hypothesis Testing**  
| **Flow Diagram for Hypothesis Testing**  
| **Measuring the Power of a Hypothesis Test**  
| **Tests of Hypotheses**  
| **Important Parametric Tests**  
| **Hypothesis Testing of Means**  
| **Hypothesis Testing for Differences between Means**  
| **Hypothesis Testing for Comparing Two Related Samples**  
| **Hypothesis Testing of Proportions**  
| **Hypothesis Testing for Difference between Proportions**  
| **Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance**  
| **Testing the Equality of Variances of Two Normal Populations**  
| **Hypothesis Testing of Correlation Coefficients**  
| **Limitations of the Tests of Hypotheses** |
| 15-16 | **Interpretation and Report Writing**  
| **Meaning of Interpretation**  
| **Why Interpretation**  
| **Technique of Interpretation**  
| **Precaution in Interpretation**  
| **Significance of Report Writing**  
| **Different Steps in Writing Report**  
| **Layout of the Research Report**  
| **Types of Reports**  
| **Oral Presentation**  
| **Mechanics of Writing a Research Report**  
| **Precautions for Writing Research Reports**  
| **How to write paper** |
PROJECT:
- Case studies are distributed between students to be studied. A proposal of a suggested research from these case studies should be submitted. This includes the identification of research hypothesis, research objectives, literature review, and research design.

POLICIES:
- MAKE UP exam policy: for students who cannot attend regular exams due to serious illness, or family emergency (all with written proof approved from the University of Jordan regulations), a makeup exam may be arranged AFTER the regular exam. The instructor must be notified prior to the exam, and no exceptions will be made.
- You are NOT ALLOWED to use CELL PHONE. Close your phone before you get to class unless you are expecting an emergency call then please let your instructor know before class.
- If you have a course-related question, please see the instructor during office hours or set an appointment by email.
- All cheating in the course will be referred to the Office of the Dean of Students
- You are expected to arrive in class and be seated on time and not leave the classroom before the instructor dismisses class. If you will not be arriving on time or have to leave early then let the instructor know beforehand.
- Individuals engaged in any activity that disturbs the attention of the class will be asked to leave the classroom immediately.

LEARNING OUTCOMES:
- To enable researchers in developing the most appropriate methodology for their research studies.
- To be familiar with the art of using different research methods and techniques.
- To be familiar with the different type of researches and how to define a structural engineering research under each type.
- To learn how to define a research problem and apply this in the assigned project.
- To learn how to design a research and apply this in the assigned project.
- To be able to test the hypothesis of selected research.