



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:**

Kothari, C.R.. *Research Methodology: Methods and Techniques*. 2<sup>nd</sup> edition, New age international publisher, 2004

Nicholas Walliman. *Research Methods: the basics*. 1<sup>st</sup> edition, Taylor and Francis group, 2011

**GRADING SYSTEM:**

Mid Exam (40%)  
Project (20%)  
Final Exam (40%)

## CONTENT:

Week	Topics
1-2	<p><b><u>Research Methodology: An Introduction</u></b>            Objectives of Research            Motivation in Research            Types of Research            Research Approaches            Significance of Research            Research Methods versus Methodology            Research and Scientific Method</p>
3-4	<p><b><u>Defining the Research Problem</u></b>            Selecting the Problem            Necessity of Defining the Problem            Technique Involved in Defining a Problem</p>
5-6	<p><b><u>Research Design</u></b>            Meaning of Research Design            Need for Research Design            Features of a Good Design            Important Concepts Relating to Research Design            Different Research Designs            Basic Principles of Experimental Designs</p>
7-8	<p><b><u>Sampling Design</u></b>            Census and Sample Survey            Implications of a Sample Design            Steps in Sampling Design            Criteria of Selecting a Sampling Procedure            Characteristics of a Good Sample Design            Different Types of Sample Designs            How to Select a Random Sample?            Random Sample from an Infinite Universe            Complex Random Sampling Designs</p>
9-11	<p><b><u>Methods of Data Collection</u></b>            Collection of Primary Data            Observation Method            Interview Method            Collection of Data through Questionnaires            Collection of Data through Schedules            Difference between Questionnaires and Schedules            Some Other Methods of Data Collection            Collection of Secondary Data            Collection of Primary Data            Observation Method            Interview Method            Collection of Data through Questionnaires            Collection of Data through Schedules            Difference between Questionnaires and Schedules            Some Other Methods of Data Collection            Collection of Secondary Data</p>

11-12	<p><b><u>Processing and Analysis of Data</u></b>  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</p>
13-14	<p><b><u>Testing of Hypotheses-I (Parametric or Standard Tests of Hypotheses)</u></b>  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</p>
15-16	<p><b><u>Interpretation and Report Writing</u></b>  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</p>

## **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.