

DEPARTMENT OF INDUSTRIAL ENGINEERING AND MANAGEMENT
MEHRAN UNIVERSITY OF ENGINEERING & TECHNOLOGY, JAMSHORO

Title of Subject	:	Research Design and Techniques	INM-707	(2+0)
Discipline	:	Industrial Engineering and Management		
Term	:	2 nd Semester 1 st Year		
Effective	:	21S- Batch and onwards		
Credit Hours	:	Th: 02 & Pr=00		
Marks	:	Th:50 & Pr=00		
Minimum Contact Hours	:	28 (For Theory)		

Aim: The aim is to provide a foundation in the statistical and mathematical methods that support the design and analysis of industrial experiments, before exploring a number of areas where recent and ongoing developments are taking place.

Objectives

- To encounter the principles of randomization, replication and stratification, and understand how they apply to practical examples.
- To explore the general theory of factorial designs to find appropriate designs for specific applications.
- To apply theory and methods to a variety of applications.
- To use the statistical software to analyze common forms of industrial experiments.

CONTENTS:

Introduction to Research

Meaning of Research, Types of Research, Research Approaches, Research Methods versus Methodology, Research Process, Criteria of Good Research, Problems Encountered by Researchers in Pakistan.

Research Design

Meaning of Research Design, Need for Research Design, Important Concepts Relating to Research Design, Different Research Designs, Developing a Research Plan.

Measurement and Scaling Techniques

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Important Scaling Techniques, Scale Construction Techniques.

Methods of Data Collection

Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Difference between Questionnaires and Schedules, Collection of Secondary Data, Selection of Appropriate Method for Data Collection.

Processing and Analysis of Data

Processing Operations, Statistics in Research, Measures of Central Tendency, Dispersion, and Skewness, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Analysis of Variance (ANOVA), Using software for processing and analysis of Data.

Interpretation and Report Writing

Meaning of Interpretation, Technique of Interpretation, Different Steps in Writing Report, Types of Reports, Mechanics of Writing a Research Report, Precautions for Writing Research Report, Plagiarism

RECOMMENDED BOOKS

1. Kothari, Chakravanti Rajagopalachari. Research methodology: Methods and techniques. New Age International, Latest Edition.
 2. Hilary Glasman-Deal, Science research writing for non-native speakers of English, Imperial College Press, Latest Edition
 3. Mark Saunders, Philip Lewis, Adrian Thornhill, Research Methods for Business Students, Pearson, Latest Edition
 4. Lester, James D., Writing research papers: a complete guide, Pearson, Latest Edition
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Approval:	Board of Studies:	Res. No. 3.1	Dated: 27.08.2019
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	Academic Council:	Res. No. -----	Dated: -----