

Course Outline: IE 631 Research Methodology

Programs	MS(IE), MS(EM), MS(EE), MS(ME)
Credit Hours	3
Duration	One Semester
Prerequisites	None
Resource Person	Dr. Ali Ahmad Assistant Professor Department of Industrial Engineering
Counseling Timing	2:00 pm to 4:00 pm
Contact	ali.ahmad@umt.edu.pk

Chairman/Director Programme signature..... Dean's signature.....

Date.....

Learning Objective

To equip students with the knowledge of research methodology so that they are in a position to make informed choices of methods during all the phases and steps of their respective research projects.

Learning Methodology

Learning methodology consists of lectures, quizzes, assignments, midterm and final examinations

Grade Evaluation Criteria

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

Marks Evaluation	Marks in percentage
Quizzes	15
Assignments	10
Mid Term	25
Attendance & Class Participation	
Term Project	
Presentations	
Final exam	50
Total	100

Recommended Text Books

Ranjit Kumar. Research Methodology, a step-by-step guide for beginners. 3rd Edition. 2011. Sage Publications India Pvt. Ltd. ISBN: 978-81-321-0648-7

Note: Fourth edition of this book has been published but is not available locally as yet.

Reference Books

- C. R. Kothari and Gaurav Garg. Research Methodology Methods and Techniques. 3rd Edition. 2014. New Dehli. New Age International (P) Ltd. ISBN: 978-81-224-3623-5
- Microsoft Encarta Encyclopedia
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Calendar of Course contents to be covered during semester

week	Activity	Reference
<u>1</u>	Definitions of research. Characteristics of research process. What research is about? Research methods and research methodology. Philosophical underpinnings for research.	Kumar Encarta Saunders
<u>2</u>	<p>Kumar Chapter 1: Research: A way of thinking</p> <p>Research and professional practice. Evidence-based practice. Applications of research. Criteria for research. Types of research.</p> <p>Zikmund Chapter 3: Theory Building (slides)</p>	Kumar Zikmund
<u>3</u>	<p>Kumar Chapter 2: Research process: a quick glance</p> <p>A generic model for research inquiry. Three phases and eight steps of research. Required knowledge for research steps. Qualitative and quantitative modes of inquiry.</p> <p>Kumar Chapter 3: Reviewing the literature</p> <p>Importance and functions of literature review. How to review literature. How to search literature from various sources like books, journals and the Internet.</p>	Kumar

<p style="text-align: center;"><u>4</u></p>	<p>Kumar Chapter 3: Reviewing the literature (continued) Reviewing the selected literature. How to read critically. Developing theoretical framework. Developing a conceptual framework. The literature review chapter.</p> <p>Kumar Chapter 4: Formulating a research problem Importance of formulating research problem. Four P's. Considerations in selecting a research problem. Steps in formulating a research problem</p>	<p style="text-align: center;">Kumar</p>
<p style="text-align: center;"><u>5</u></p>	<p>Kumar Chapter 5: Identifying variables What is a variable? The difference between a concept and a variable. Converting concepts into variables. Types of variables. Types of measurement scale</p>	<p style="text-align: center;">Kumar</p>
<p style="text-align: center;"><u>6</u></p>	<p>Kumar Chapter 6: Constructing hypotheses The definition of a hypothesis. The functions of a hypothesis. The testing of a hypothesis. The characteristics of a hypothesis. Types of hypothesis. Errors in testing a hypothesis. Hypotheses in qualitative research</p>	
<p style="text-align: center;"><u>7</u></p>	<p>Kumar Chapter 7: The research design What is a research design? The functions of research design. The theory of causality and the research design.</p>	<p style="text-align: center;">Kumar</p>

<p style="text-align: center;"><u>8</u></p>	<p>Kumar Chapter 8: Selecting a study design</p> <p>Differences between quantitative and qualitative study designs. Study designs in quantitative research and their variations. Study designs in qualitative research. Other commonly used philosophy-guided designs.</p>	<p style="text-align: center;">Kumar</p>
<p style="text-align: center;"><u>9</u></p>	<p>Kumar Chapter 9: Selecting a method of data collection</p> <p>Differences in the methods of data collection in quantitative and qualitative research. Major approaches to information gathering. Collecting data using primary sources. Methods of data collection in qualitative research. Collecting data using secondary sources</p>	<p style="text-align: center;">Kumar</p>
<p style="text-align: center;"><u>10</u></p>	<p>Kumar Chapter 10: Collecting data using attitudinal scales</p> <p>Measurement of attitudes in quantitative and qualitative research. Attitudinal scales in quantitative research. Functions of attitudinal scales. Difficulties developing an attitudinal scale. Types of attitudinal scale. Attitudinal scales and measurement scales. Attitudes and qualitative research</p>	<p style="text-align: center;">Kumar</p>
<p style="text-align: center;"><u>11</u></p>	<p>Kumar Chapter 11: Establishing the validity and reliability of a research instrument</p> <p>The concept of validity. Types of validity in quantitative research. The concept of reliability. Factors affecting the reliability of a research instrument. Methods of determining the reliability of an instrument in quantitative research</p>	<p style="text-align: center;">Kumar</p>

<p><u>12</u></p>	<p>Kumar Chapter 12: Selecting a sample</p> <p>The differences between sampling in quantitative and qualitative research. Sampling in qualitative research</p>	<p>Kumar</p>
<p><u>13</u></p>	<p>Kumar Chapter 13: How to write a research proposal</p> <p>The research proposal in quantitative and qualitative research. Contents of a research proposal.</p>	<p>Kumar</p>
<p><u>14</u></p>	<p>Kumar Chapter 14: Considering ethical issues in data collection</p> <p>Kumar Chapter 15: Processing data</p> <p>Kumar Chapter 16: Displaying data</p>	<p>Kumar</p>
<p><u>15</u></p>	<p>Kumar Chapter 17: Writing a research report</p> <p>Developing an outline. Writing about a variable. Referencing. Writing a bibliography.</p>	<p>Kumar</p>