Course Title: Research Methodology

Course Code: RM-898

Credit Hours: 2-0

Prerequisite: Nil

Course Objectives

a. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary scientific practices in specific disciplines.
b. Application of systematic approaches to conduct and manage scientific projects.
c. Ethical conduct and professional accountability.
d. Effective oral and written communication in professional domain.
e. Data security and professional use and management of information.
f. Research analysis and drawing inferences from research data.

Course Outcomes

a. Understanding the concept of research and circumstances under which formal research is required in the field of science & engineering.
b. Approach scientific research problems in a structured and strategic manner.
c. Formulate a research problem with Specific, Measureable, Achievable, Relevant and Time-bound (SMART) objectives.
d. Undertake an effective literature review to learn the background material required for research projects and also to identify ongoing state of the art research in the specific area.
e. Communicate findings of a literature review following accepted standards and traditions of scientific disciplines – especially with regard to referencing and citation.
f. Prepare and communicate a formal research proposal including a plan, a convincing justification, and formal placement of time bound objectives within the context of the current state of research in a specific area.
g. Understand and describe the ethical obligations associated with conducting research.

h. Identify many different forms of plagiarism and ethical breaches.

i. Understand and be able to implement best practices in data management and security.

j. Demonstrate both written and oral communication skills to explain a scientific research exercise to specialist and non-specialist audiences with motivation, approach, justification, and key outcomes.

**Course Contents**

1. Introduction to Research Methodology Research Topic Discussion

2. Scientific Approach Research Topic Finalization

3. Literature Review Seminal Paper Search

4. Research Design EndNOTE®

5. Planning & Management Problem Solving: Literature Review

6. Intro to Software for Data Analysis & Visualization Excel®, MATLAB®, SPSS, etc.

7. Credibility of Research Findings & Threats to Reliability

8. Technical Writing Problem Solving: Literature Review


11. Technical Speaking Review of Group Discussion Topic

12. Introduction to NUST PG Policies & MS TH-Forms

14 Guest Speaker Talk on Research Methodology from an expert

15 Research Proposal Presentations

16 Research Proposal Presentations