



Birla Institute of Technology & Science, Pilani
Hyderabad Campus

ACADEMIC – GRADUATE STUDIES AND RESEARCH DIVISION
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI-HYDERABAD
CAMPUS
SECOND SEMESTER 2023-2024
Course Handout Part II

Date: 09.01.2024

In addition to Part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : BITS E661 (5 – Units)
Course Title : Research Methodology-I
Instructor-in-Charge : K. Srinivasa Raju

COURSE OBJECTIVE:

This course aims at training Ph.D. students towards acquiring competence in methodologies and methods involved in academic research. The course will expose students to various components of scientific research, including literature review, framing and testing hypotheses, designing research, data collection and analysis, writing reports and research proposals, and ethics.

SCOPE OF THE COURSE:

Topics listed in the next section, listed in several modules under Course Outline, will be covered under the course.

For Full time and Part Time, Ph.D. students: Topics listed in the next section will be covered under the course as per the classes given in the time table.

For PhD Aspirants: The course will involve self-learning by the students and the inputs (as required) from the Instructor In-charge.

LEARNING OUTCOMES:

1. Examine the validity of a hypothesis.
2. Demonstrate the ability to use search engines to gather and review literature.
3. Apply statistical methods to analyze data for determining errors, outliers, and correlations.
4. Demonstrate the ability to make an organized presentation on a research topic.
5. Apply ethical principles to situations that arise during research involving humans and animals.

OPERATION OF THE COURSE:

All the registered students are expected to engage completely in the course. Student groups will be formed who will work on a research problem and learn the rudiments of research. The instructors will give brief presentations before the beginning of an evaluation component and assist and monitor the progress continuously.

REFERENCE(S):

1. Thomas CG (2015). Research Methodology and Scientific Writing, Springer
2. Kothari CR, Garg G (2020). Research Methodology: Methods and Techniques. New Age International.

COURSE OUTLINE

Module (Lecture number)	Learning outcomes	Topics to be covered
1 (1-6)	Introduction of Research Methodology: Literature survey/ Defining a problem to be addressed	Approaches to Research: Resources or search engines available for gathering information and literature in the related area, Critical review of available literature, Problem Identification & Formulation (finding research gaps), Research Question, Concept of a research proposal
2 (7-20)	Research Design: Data Collection & analysis	Data collection/ Sampling: Concepts of Statistical Population, Sample Size, Sampling Error, Practical considerations in sampling and sample size, Probability, Distribution functions, Data Preparation, and Data Analysis Hypothesis Testing, Logic & Importance Features of a good research design, Concept of Independent & Dependent variables, Linear and Non-linear regression, Artificial Neural Networks, Fuzzy logic (membership functions) , Introduction to Multicriterion decision making, Software Demonstration
3(21-28)	Research documentation, presentation, and Ethics	Structure and components of the research report, seminar, and paper presentations Writing Research papers, Essential components for Thesis writing & Scientific editing tools, Synopsis, Importance of ethics in research, Ethical issues related to publishing; Plagiarism and Self-Plagiarism, Use of anti-plagiarism software, originality in research, conflict of interest. Human and animal ethics, Intellectual Property Rights, copyright.

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time of examination/submission date	Nature of Component
Assignment-1 [based on modules 1 & 2]	NA	20	Will be announced in the class	Open book
Mid-Semester Evaluation	90 minutes	25	Will be announced in the class	Open Book
Assignment -2 [based on module 2]	NA	15	Will be announced in the class	Open book
Final Project report and presentation [based on modules 1 and 3]	NA	40	Will be announced in the class	Open book

Chamber Consultation Hour: Monday 5 P.M

Notices: All notices concerning the course will be displayed in google classroom

Make-up Policy: Make-up will not be entertained under any circumstances.

Academic Honesty and Integrity Policy: Academic honesty and academic integrity are to be maintained by all of the students throughout the Semester, and no type of academic dishonesty is acceptable.

Instructor in Charge