Course Outline

Research Methodology

DOCTORAL COURSE WORK

2021

At – Ramchandrapur, P.O Jatni, Dist: Khurda, 752050

http://www.cutm.ac.in

RESEARCH METHODOLOGY

1. Nomenclature

Subject Name	Code	Type of course	Credit	T-P-P	Prerequisite
RESEARCH METHODOLOGY	CUTM2443	Theory		4-0-0	

1. Course Objective

a) The objective of the course is to introduce early career researchers to the methodology, methods and techniques of research.
b) The course aims to present research as a dynamic process beginning from questions to answers, showing clearly how researchers progress from one stage to the next.
c) To understand some basic concepts of research and its methodologies.
d) To organize and conduct research (advanced project) in a more appropriate manner.

2. Course Outcome

a. Students can understand the ethical and philosophical issues associated with research in education.
b. This study provides knowledge on various modes of presenting and disseminating research findings.
c. Enable students to acquire expertise in the use and application of the methods of data collection and analysis.
d. Provide learning opportunities to critically evaluate research methodology and findings.
e. Enable students to be reflexive about their role and others' roles as researchers.

3. Pedagogy and Expectations from the Students

The readings for the course will be from a variety of sources. The course will be delivered through formal lectures, self-readings, seminars, exercises and project work undertaken by the students. The conceptual frameworks in the field being researched will be examined. Critically reviewing and analysing research works will also be adopted in this course.

The sessions follow the logic of conducting a research beginning with a brief introduction to ontology and epistemology which enable the conceptualization of a research project. This will be followed by an in-depth understanding of methodological approaches and methods to be adopted. Finally, the focus will be on critical analysis of the data gathered and the presentation of the same in reports.

After few introductory sessions, the focus will be in analyzing some research projects to determine what was right and what could have been done better. It will help students to determine the approaches that they can be engaged in during their research.

Students are welcome to interact with the instructors outside the class, on topics/concepts that could not be covered within the limited time of the class sessions. Students are expected to follow the Research Style Manual of the Centurion University available in its website.

Recommended reading materials include
- Ranjit Kumar, 2011, Research Methodology: A Step by Step Guide, Sage South Asia Publications
- Sotorios Sarantakos, 2004 (3rd ed.), Social Research, Palgrave
- Lawrence Neuman, 2010 (7th ed.), Research Methods, Pearson
- Norman Denzin & Yvonna Lincoln, 2005 (3rd ed.), Handbook of Qualitative Research, Sage

Note: Faculty teaching RM will also recommend references for the students.

3. Evaluation

The evaluation will be through an open-book end semester examination. Each student will develop a research proposal for her/his research at the end of the course.

Internal – 40% marks
External – 60% marks

4. Feedback and Grievance Redressal

Feedback is invited at all times. Students' evaluation of the course will be considered seriously and in an open-minded way by the Course Coordinator. While conveying dissatisfaction, if any, it is suggested to identify the desired outcome. In case the issues are not resolved, the same can be brought to the notice of the Vice chancellor.

5. Academic Misconduct

Plagiarism in the university is considered as the presentation of the work, idea or creation of another person as though it is your own. Any work submitted must be one's own. When own ideas, texts, quotes and information are not used one must identify the source of that work with complete and comprehensive referencing. The Centurion University of Technology and Management will automatically fail the student who do not suitably acknowledge the work of others.

Plagiarised material can be drawn from, and presented in, written, graphic and visual form, including electronic data, and oral presentations. Plagiarism occurs when the origin of the material used is not appropriately cited.

Examples of plagiarism include:

• Copying sentences or paragraphs word-for-word from one or more sources, whether published or unpublished, which could include but is not limited to books,

journals, reports, theses, websites, conference papers, course notes, etc. without proper citation;
• Closely paraphrasing sentences, paragraphs, ideas or themes without proper citation;
• Piecing together text from one or more sources and adding only linking sentences;
• Copying or submitting whole or parts of computer files without acknowledging their source;
• Copying designs or works of art and submitting them as your original work;
• Copying a whole or any part of another student's work; and
• Submitting work as one's own that someone else has done.

Enabling Plagiarism, i.e. the act of assisting or allowing another person to plagiarise is considered unethical and will draw severe penalty, including expulsion from the course.

6. **Schedule of Sessions**

Module I
Overview and orientation of the course: What constitutes research? An overview of history of mankind and the centrality of human beings (anthropocentricism). Understanding basic concepts of research such as Ontology, Epistemology, Methodologies and Methods.

Module II
Meaning and Objectives, Types of Research - Basic and Applied Researches. Research Approaches - Discrete vs Analytical Research, Applied vs Fundamental Research, Qualitative vs Quantitative Research, Conceptual vs Experimental (or Empirical) Research. Steps in Research Process. Research Methods and Methodology - Criteria for Good Research - Research Objectives.

Module III
Selecting and defining a research problem: What is research problem, selecting the problem, necessity of defining the problem, technique involved in defining a problem, Hypothesis and its functions.

Research Design: 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, important experimental designs.

Module IV
Literature Review: What is literature review? Significance of Literature Review. Steps in Conducting Literature Review - Guidelines on Style, Mechanics and language usage - Writing up to the literature Reviewed - Some Examples.

Module V

Design of Experiments: Types of Experiments - Experimental Design Factors Experimental Design Protocol Numerical and Analytical Experiments - Computer Simulation and Software usage.

Module VI

Data Collection and Sampling: Types of data, Different Approaches of Data Collection, Collection of primary and secondary data, General procedure for data collection-observation method, interview method, data collection through questionnaires and schedules. Sampling: Different sampling techniques and sample size. Scaling: importance scaling, different scaling techniques.

Module VII

Data Analysis: Data Errors - Identification of Data Errors - Causes and Types of Data Errors. Error Analysis - Evaluation of uncertainties for complicated Data Reduction. Statistical Analysis of Experimental Data - Probability Distribution - Gaussian and other Distributions. Chi-square test of Goodness of Fit Method of least squares - Correlation Coefficient Multivariable Regression-Standard deviation Student's t-Distribution. Graphical Analysis and Curve Fitting - Choice of Graph's Formats - General considerations in Data Analysis.

Module VIII

Thesis and Report Writing: Definition and significance of a Thesis and research report, Level of work for Doctoral and Graduate Thesis. General Requirements of a good Thesis - Originality, Style, Presentation, Definitions and Terminology - Terms and Phrases to be avoided. Grammar and logic Bellman's rule of 3 in Report writing. Precautions for writing research report. Canonical organisation of chapters in thesis documents suggested Thesis structure for Doctoral thesis.

Citation Styles, Style guides and avoiding plagiarism - APA style of research publication. Writing of a Research paper for a conference or journal - Concepts of a Research Article - Content & Style - Journal Style - Sections of a paper - Significance of sections on results, Discussion and conclusion.

References:
1) Research Methodology - Methods and Techniques by C.R. Kothari New Age International (P) Ltd.
2) Experimental Methods for Engineers by J.P. Holman TMH
3) Engineering Research Methodology by Krishnan Nallaperumal
4) Experimental Design & Methodology by Rafal Kicinger R. Paul Wiegand
5) Research Methodology -Handout on Literature Review (Personal Communication)

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