

KU8DSECHE406: RESEARCH METHODOLOGY

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE	400	KU8DSECHE406	4	60

Learning Approach (Hours/ Week)		Marks Distribution			Duration of ESE (Hours)
Lecture/Tutorial	Practical/ Internship	CE	ESE	Total	
4	0	30	70	100	2

Course Description: This course introduces research methodology, exploring research types, problem formulation, design principles, data collection and analysis, and scientific reporting. It covers ethics in research, including scientific misconduct and publication standards, emphasizing intellectual honesty and integrity. Practical guidance on literature review, thesis writing, and effective communication enhances students' research skills and prepares them for academic and professional research environments.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand various research types and methodologies, distinguishing between descriptive, analytical, applied, and fundamental research approaches effectively.	U
2	Develop skills to define and formulate research problems, utilizing extensive literature reviews and constructing well-grounded research hypotheses.	An
3	Gain proficiency in research design principles, data collection methods, and statistical analysis using relevant tools and software.	E

4	Master the structure and components of scientific reporting, including thesis writing, ethical considerations, and effective oral presentations.	C
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**Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	3	3	2	2	2	3	2
CO 2	3	1	2	2	2	1	2
CO 3	2	3	2	2	1	3	2
CO 4	3	2	2	2	2	3	2
CO 5	3	2	2	2	2	3	2

Course Contents for Classroom Transaction:

M O D U L E	U N I T	DESCRIPTION	HOURS
1		INTRODUCTION AND TYPES OF RESEARCH	6
	1	Motivation and objectives – Research methods vs Methodology.	
	2	Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical.	
2		RESEARCH FORMULATION	15

	1	Defining and formulating the research problem-Selecting the problem	
	2	- Necessity of defining the problem.	
	3	Importance of literature review in defining a problem – Literature review- Primary and secondary sources – reviews, treatise, monographs-patents – web as a source	
	4	Development of working hypothesis	

	RESEARCH DESIGN AND DATA ANALYSIS		12
3	1	Research design – Basic Principles- Need of research design — Features of good design.	
	2	Data Collection and analysis: Execution of the research - Observation and Collection of data - Methods of data collection – Sampling Methods	
	3	Data Processing and Analysis strategies - Data Analysis with Statistical Packages - Hypothesis-testing - Generalization and Interpretation	

	REPORTING AND THESIS WRITING		15
4	1	Structure and components of scientific reports - Types of report – Technical reports and thesis – Significance- Different steps in the preparation – Layout, structure and Language of typical reports – Illustrations and tables, Bibliography, referencing and footnotes	
	2	Oral presentation – Planning – Preparation – Practice – Making presentation – Use of visual aids - Importance of effective communication.	

5	TEACHER SPECIFIC MODULE-		12
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	<i>RESEARCH ETHICS or any other topic relevant to the course can be included</i>	
1	Ethics-definition, scientific conduct- Ethics with respect to science and research, Intellectual honesty and research integrity	
2	Scientific misconducts-falsification, fabrication and plagiarism (ffp) Redundant publications- duplicate and overlapping publications.	
3	Publication ethics: definition, introduction and importance. Best practices/standards setting initiatives and guidelines: COPE, WAME etc. Conflicts of interest (Definition only).	
4	Publication misconduct (Definition). Predatory publishers and journals.	
5	Open access publications and initiatives. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder etc.	
6	Use of plagiarism software like Turnitin, Urkund and other open-source software tools. Databases (Indexing and Citation) And Research Metrics (Impact Factor of Journal, h-index)	

Essential Readings:

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. *An introduction to Research Methodology*, RBSA Publishers.
2. Kothari, C.R., 1990. *Research Methodology: Methods and Techniques*. New Age International. 418p.
3. Sinha, S.C. and Dhiman, A.K., 2002. *Research Methodology*, Ess Publications. 2 volumes.
4. Trochim, W.M.K., 2005. *Research Methods: the concise knowledge base*, Atomic Dog Publishing. 270p.
5. Wadehra, B.L. 2000. *Law relating to patents, trademarks, copyright designs and geographical indications*. Universal Law Publishing.

Additional Reading

1. Anthony, M., Graziano, A.M. and Raulin, M.L., 2009. *Research Methods: A Process of Inquiry*, Allyn and Bacon.
2. Carlos, C.M., 2000. *Intellectual property rights, the WTO and developing countries: the TRIPS agreement and policy options*. Zed Books, New York.
3. Coley, S.M. and Scheinberg, C. A., 1990, "*Proposal Writing*", Sage Publications.
4. Day, R.A., 1992. *How to Write and Publish a Scientific Paper*, Cambridge University Press.
5. Fink, A., 2009. *Conducting Research Literature Reviews: From the Internet to Paper*. Sage Publications
6. Leedy, P.D. and Ormrod, J.E., 2004 *Practical Research: Planning and Design*, Prentice Hall.
7. Satarkar, S.V., 2000. *Intellectual property rights and copy right*. Ess Publications.

Web References:

1. American Psychological Association (APA), Research Methodology, www.apa.org/research/methodology
2. National Institutes of Health (NIH), Research Methods Resources, www.nih.gov/research-training/research-methods
3. SAGE Publications, Research Methods, www.sagepub.com/research-methods
4. Elsevier, Researcher Academy, www.researcheracademy.elsevier.com
5. ResearchGate, Research Design and Methods, www.researchgate.net/research-design-methods

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		70
Continuous Evaluation		30
a)	*Test Paper	12
b)	Assignment	6
c)	Seminar	6
d)	Viva-Voce	6
Total		100

*Average mark of the best two written tests may be considered for internal mark.