

<b>Branch Name:</b>	IMCA
<b>Program Code:</b>	CS301
<b>Course Title</b>	Research Methodology
<b>Course Code</b>	1CS3010606T
<b>Pre-requisite Course:</b>	Basic understanding of basic statistics, Basic proficiency in using computers and software tools (such as Microsoft Excel or Word),

**Course Objective:**

1. Understand the fundamental principles of research and its importance in the context of Information Management, Computer Applications, and related fields.
2. Formulate a research problem, develop a hypothesis, and design a research study using appropriate research methodologies, ensuring a structured approach to problem-solving.
3. Utilize various data collection and sampling techniques, distinguish between qualitative and quantitative research, and understand when to apply each method.
4. Analyze and interpret research data effectively using basic statistical methods and tools (such as SPSS or R), and critically assess the results of research.
5. Develop academic research reports that follow standard formats, including proper referencing and citation methods, while ensuring clarity and coherence in presenting findings.
6. Understand and apply ethical principles in research, including avoiding plagiarism, respecting confidentiality, and upholding academic integrity.
7. Critically evaluate existing research literature, identifying strengths, weaknesses, and gaps, and gain the ability to contribute to research discussions

**Teaching and Examination Scheme:**

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	-	0	-	-	-	-	-

**Course Contents:**

Unit No	Topics	Total Hours	Weightage (%)
1	<p><b>Unit 1: Introduction to Research Methodology</b></p> <p><b>Definition and Importance of Research:</b> Meaning of Research, Objectives of Research, Types of Research: Basic, Applied, Descriptive, Analytical, and Experimental</p> <p><b>Research Process:</b> Overview of the Research Process, Steps in Research, Identifying Research Problems</p> <p><b>Research Design :</b> Meaning and Importance of Research Design, Types of Research Designs: Exploratory, Descriptive, Experimental</p> <p><b>Formulation of Research Hypothesis</b></p> <p>Definition of Hypothesis, Characteristics of a Good Hypothesis ,Types of Hypothesis: Null Hypothesis, Alternative Hypothesis</p>	05	20

2	<p><b>Unit 2: Literature Review and Research Tools</b></p> <p><b>Literature Review :</b> Purpose of a Literature Review, Steps in Conducting a Literature Review, Sources of Literature (Books, Journals, Articles)</p> <p><b>Types of Research Tools :</b> Primary vs. Secondary Data, Data Collection Methods: Survey, Interviews, Observation , Questionnaire Design: Types of Questions (Open, Closed, Likert Scale) ,Use of Scales and Indexes</p> <p><b>Sampling Techniques :</b> Sampling: Definition and Importance, Types of Sampling Methods: Probability and Non-Probability Sampling, Sampling Error and Bias</p>	05	20
3	<p><b>Unit 3: Data Analysis and Interpretation</b></p> <p><b>Data Processing and Analysis :</b> Organizing Data: Coding, Categorizing, and Tabulation, Descriptive Statistics: Mean, Median, Mode, Standard Deviation, Variance, Inferential Statistics: Population, Sample, Sampling Distribution</p> <p><b>Hypothesis Testing :</b> Concept of Significance Level and P-value, Types of Tests: t-test, Chi-Square Test, Z-test, Confidence Intervals</p> <p><b>Use of Statistical Tools :</b> Introduction to SPSS or R for Statistical Analysis, Practical examples of data entry, processing, and analysis</p>	05	20
4	<p><b>Unit 4: Report Writing and Presentation</b></p> <p><b>Structure of a Research Report :</b> Title, Abstract, Introduction, Methodology, Results, Discussion, Conclusion, References and Citations, Research Paper Formula</p> <p><b>Presentation of Research Findings :</b> Use of Visual Aids (Graphs, Charts, Tables), Oral Presentation of Research Results , Ethical Considerations in Research Reporting</p> <p><b>Plagiarism and Ethical Issues :</b> Concept of Plagiarism, Avoiding Plagiarism: Proper Citation and Referencing, Ethical Research Practices</p>	05	20
5	<p><b>Unit 5: Advanced Topics in Research Methodology</b></p> <p><b>Qualitative vs. Quantitative Research :</b> Differences between Qualitative and Quantitative Research, Qualitative Research Methods: Case Study, Focus Group, Grounded Theory, Quantitative Research Methods: Survey, Experimentation, Statistical Analysis</p> <p><b>Emerging Trends in Research :</b> Interdisciplinary Research, Use of Technology in Research (Big Data, Machine Learning, AI in Research), Ethical Considerations in New Research Areas (Data Privacy, AI Ethics)</p> <p><b>Critical Analysis of Research :</b> Reviewing Published Research Papers, Analyzing Research Methodology, Writing a Critical Review of Research</p>	05	20

**Text Books:**

1. **C.R. Kothari**, *Research Methodology: Methods and Techniques*, 4th Edition, New Age International Publishers, 2019.

**References Books:**

1. **Ranjit Kumar**, *Research Methodology: A Step-by-Step Guide for Beginners*, 4th Edition, Sage Publications, 2019.
2. **William M. K. Trochim**, *Research Methods Knowledge Base*, 3rd Edition, Atomic Dog Publishing, 2006.
3. **John W. Creswell**, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th Edition, Sage Publications, 2017.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand the fundamentals of research methodology and its importance	Remembering, Understanding
CLO2	Learn how to design a research project and develop a research hypothesis	Applying, Creating
CLO3	Learn the techniques for data collection, processing, and analysis	Applying, Analyzing
CLO4	Understand how to write and present research findings in an academic format	Analyzing, Evaluating
CLO5	Gain insights into ethical research practices and plagiarism	Creating, Evaluating
CLO6	Develop an ability to critically analyze research papers	Applying, Evaluating

**Mapping of CLOs with POs & PSOs**

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H	M		H									L	M
CLO2		H	M	H									L	H
CLO3		M		H	H								M	H
CLO4								M	M	H			L	M
CLO5						M		H					L	M
CLO6		H		M						M			L	H

**H:High, M:Medium, L:Low**