SEMESTER – III			
CORE XVI - RESEARCH METHODOLOGY			
Code : 19PCSC34	**Hrs / Week : 4**	**Hrs / Sem : 60**	**Credits : 4**

Vision:

Achieve outstanding scientific research in various areas of knowledge.

Mission:

Encourage distinguished research work through the creation of an attractive and stimulating environment to achieve goals.

Course Outcome :

CO. No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Integrating knowledge of research processes.	8	An
CO-2	Identifying the overall process of designing a research study.	8	Re
CO-3	Carrying out ethical issues in research.	8	Ap
CO-4	Explaining the concepts of research and its methodologies.	2	Un
CO-5	Identifying the key elements of a research report.	8	Re
CO-6	Finding the problem for research.	8	An
CO-7	Understanding Plagiarism and its types.	8	Un
CO-8	Apply the knowledge of teaching methods for its wide applicability.	8	Ap

UNIT - I

Research Methodology– Introduction - Meaning of research – Objectives of research – Types of Research – Research Approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific Method – Research Process - Criteria of Good Research.

UNIT – II

Research Problem – Selecting the Problem – Necessity of Defining the Problem – Technique involved in defining a problem – Meaning of Research Design – Features of a good design.

UNIT – III

Component of Scientific report – Scientific writing style – Report writing and its types – Reporting and Thesis writing – Citations – Citation Styles – Journal impact Factor – Bibiliography.

UNIT – IV

Ethical issues within the research process – Research Commercialisation – Types of intellectual property – Royalty – Plagiarism – Types of plagiarism - Tools for detecting plagiarism

UNIT – V

Methodology of teaching – Objectives for teaching – Structure of teaching – Phases of teaching – Various teaching methods.

Reference Books

1. Statistical Methods - S.P. Gupta
2. Research Methodology Methods and Techniques - C.R. Kothari
3. Statistics (Theory and Practice) - B.N. Gupta
4. Research Methodology Methods and Statistical Techniques - Santosh Gupta

SEMESTER – III			
ELECTIVE II - OBJECT ORIENTED SOFTWARE ENGINEERING			
Code : 19PCSE32	**Hrs / Week : 4**	**Hrs / Sem : 60**	**Credits : 2**

Vision:

To be a professional developer of software products

Mission:

To understand different conventions in software modelling

To perform software testing and validation

Course Outcome:

CO.No	Upon Completion of this course, students will be able to	PSOs Addressed	CL
CO-1	Design and implement a software system to meet desired needs.	3,6	**Cr**
CO-2	Identify requirements of systems and applications.	3	**An**
CO-3	Use modern software systems and tools.	1,6	**Ap**
CO-4	Understand different software life cycle concept.	7	**Un**
CO-5	Study and design SRS documents for software projects.	3,8	**An**
CO-6	Study and model software projects using different modelling techniques.	3,8	**An**
CO-7	Understand different techniques to map models to code	7	**Un**
CO-8	Discuss about project organisation and communication	8	**Ev**

Unit I

Software Life Cycle Models: System concepts – Project Organisation – Communication – Life cycle models – Unified Process – Iterative and Incremental – Workflow – Agile Processes-Project Planning and Estimation.

Unit II

SRS Documentation: Requirements Elicitation – Requirement Documentation – Use Cases – Unified Modeling language-Introduction.

UML Diagram: - Class diagrams – Sequence diagrams – Object diagrams – Deployment diagrams – Use case diagrams –State diagrams, Activity diagram, Component diagrams, Case Study, Identifying Classes – Noun Phrase Approach, Common class Pattern Approach, Use-CaseDriven Approach, CRC.

Unit III

Analysis Phase: Analysis Object Model (Domain Model)- Analysis Dynamic Models- Non-functional requirements – Analysis Patterns.

Design Phase: System Design Architecture – Design Principles – Design Concepts – Design Patterns – Architectural Styles – Dynamic Object Modeling – Static Object Modeling – Interface Specification – Object Constraint Language.

Unit IV

Mapping: Mapping Design(Models) to Code – Model Transformation – Refactoring – Mapping Associations – Mapping Activities.

Testing & Implementation: Testing **–** Configuration Management – Maintenance process – System documentation –program evolution dynamics.

Unit V:

Project Organization and Communication: Introduction: A Rocket Example - An Overview of Projects - Project Organization Concepts - Project Communication Concepts - Organizational Activities.

Methodologies: Introduction: The First Ascent of K2 - Project Environment - Methodology Issues - A Spectrum of Methodologies - Case Studies.

Reference Books

1. Bernd Bruegge, Alan H Dutoit, "Object Oriented Software Engineering" Second edition, Pearson Education, 2004.
2. Craig Larman, "Applying UML and Patterns" Third edition, Pearson Education, 2005.
3. Object-Oriented Software Engineering Using UML, Patterns, and Java, 3rd Edition By Bernd Bruegge, Allen H. Dutoit Published by Pearson
4. Stephen Schach, "Software Engineering" Seventh edition. McGraw-Hill, 2007.
5. Ivar Jacobson, GrandyBooch, James Rumbaugh, "The Unified Software development Process", Pearson Education, 1999.
6. Alistair Cockburn, "Agile Software Development" Second edition, Pearson
7. Education, 2007.