LNCT UNIVERSITY, BHOPAL

Programme:- BCA (CA) **Semester – IV** **wef: July 2025**

Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Java Programming (Major)	BCA-401	3	1	0	70	30	100

Course Objective	To understand the core language features of Java and its Application Programming Interfaces (API). To build applications using the set of powerful java features. To explore and publish a useful real time application.

Units	Contents (Theory)	Hours /week
I	Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming Benefits of OOP; Applications of OOP. Java History; Java Features; Java Support Systems, Java Environment.	8
II	Simple Java Program; Comments in java; Java Program Structure; Java Tokens; Java Statements; Implementing a Java Program; Java Virtual Machine; Command Line Arguments; Programming Style; Constants; Variables; Data Types; Variables, Constants, Standard Default Values, Operators, Expressions; Operator Precedence; Mathematical Functions.	8
III	Decision making and Branching Statements, Looping Statements, Labeled loops, Jumping Statements, Defining a Class; Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing Class Members; Constructors; Methods Overloading; Static Members; Nesting of Methods.	8
IV	Extending a Class; Overriding Methods; Final Variables and Methods; Final Classes, Wrapper Class, Finalizer Methods; Abstract Methods and Classes; Visibility Control; Defining Interfaces; Extending Interfaces; Implementing Interfaces; Accessing Interface Variables, Basic idea of multithreading, lifecycle of a thread; Creating thread with the thread class and runnable interface, Basic idea of Exception Handling.	8
V	System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package; Hiding Classes, Swing Life Cycle; Creating an Executable Swing, Data Connectivity (JDBC-ODBC).	8

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Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
E-Balagurusamy	Programming In Java	Fourth Edition	Tata McGraw Hill
Michael B. White	Mastering Java	Second Edition	BPB Publications
Ivan Bayross	Advance Java	Second Edition	BPB Publications

COURSE OUTCOMES: Students will be able to

CO1	Understand basic concepts and benefits of Object-Oriented Programming.
CO2	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO3	Explore and publish a useful real time application.
CO4	Create functionality that subclasses can implement or override.
CO5	Process of how the object is created, started, stopped, and destroyed during the entire execution of its application.

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Name of Paper & Category	Paper Code	Theory					
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		L	T	J	EST	CAT	Total
Web Technologies (Minor)	BCA-402	3	1	0	70	30	100

Course Objective	Students will gain the theoretical skills and practical experience required for web design and development and they will also learn to develop, host and maintain a responsive website.

Units	Contents (Theory)	Hours /week
I	**Introduction:** Internet and World Wide Web, Evolution and History of World Wide Web, Basic features, Web Browsers; Web Servers, Hypertext Transfer Protocol, Overview of TCP/IP and its services, URLs, Searching and Web-Casting Techniques, Search Engines and Search Tools.	**8**
II	**Web Publishing:** Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML. Creating a Website and the Markup Languages.	**8**
III	**Web Development:** Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts.	**8**
IV	**Images:** Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes; DHTML: Dynamic HTML, Features of DHTML, CSSP (cascading style sheet positioning).	**8**
V	**Introduction to E-Commerce**: Definition of Electronic Commerce, E-commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective, Types of E-commerce, Internet and Extranet, Digital signature, Mobile Commerce.	**8**

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Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Raj Kamal	Internet and Web Technologies	II	Tata McGraw-Hill.
Ramesh Bangia	Multimedia and Web Technology	II	Firewall Media.
Thomas A. Powell,	Web Design: The Complete Reference	IV	Tata McGrawHill
Wendy Willard,	HTML Beginners Guide	I	Tata McGraw-Hill.
Deitel and Goldberg,	Internet and World Wide Web, How to Program	II	PHI.

COURSE OUTCOMES: Students will be able to

CO1	Implement an appropriate planning strategy for developing websites
CO2	Create a webpage and use scripting languages to transfer data and add interactive components to other web pages.
CO3	Structure and implement HTML/CSS.
CO4	Understand how to insert and use forms, Images and Buttons.
CO5	Analyze the impact of E-commerce on business models and strategy

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Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Computer Oriented Statistical Methods (GEC)	BCA-403	3	1	0	70	30	100

Course Objective	The objective of this course is to give comprehensive knowledge about the data collection, presentation of data, pictorial representation, and measures of central tendency, measures of dispersion, control charts, correlation, regression, time series, probability, estimation and inference.

Units	Contents (*Theory*)	Hours /week
I	**Introduction to Statistics and Data Collection:** Definition of statistics, scope of statistics, limitation of Statistic, distrust of statistics. Statistical data collection- primary and secondary data, methods of collecting primary data Sources and secondary data, Census and sample investigation. Presentation of statistical data-classification, Tabulation, frequency distribution, graphic representation of a frequency distribution,	**8**
II	**Describing Business Data:** Requisites for an ideal measure of central tendency-Arithmetic- Mean, median, mode, Harmonic Mean, weighted Average, Relationship amongst different averages. Measures of Dispersion, Range, Quartile deviation, Mean Deviation, Standard Deviation-The coefficient of Variation.	**8**
III	**Sample Space, Events and Probability:** Definition of sample space, Discrete sample space, Events, Types of events, Mutually exclusive events, Exhaustive event, Simple examples, Classical definition of probability, Addition theorem of probability, conditional probability, Independence of two events.	**8**
IV	**Graphical representation**: Diagrammatic and Graphical representation of Numerical Data - Formation of frequency distribution - Histogram, Cumulative Frequency - Polygon and Ogives, Column, Pie chart, Line, Bar, Area, Scatter & Bubble Chart.	**8**
V	**Statistical Control Charts:** Statistical Control Charts- Introduction - Types of Control Charts – Setting up a Control Procedure – X bar (Mean) Chart and R Chart–c Chart–p Chart–Advantages and Limitation of Control Charts. Statistical Software like Excel, SPSS.	**8**

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Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Trivedi K.S.	Probability and Statistics with Reliability, Queuing and computer Science applications	1994	Prentice Hall of India.
David. Levin, David. Stephen	Statistics for managers using MS-Excel	2013, 7th Edition	Pearson Education (India)
S. M. Shukla,	Business Mathematics	12th ed, 2018	Sahitya Bhawan Publications
H. S. Sharma	Mathematical Statistics	First Edition, 2017	Ram Prasas Pub
S. P. Gupta	Business Statistics and Statistical Methods	2014	S. Chand Pub.
Andy Field	Discovering Statistics Using IBM SPSS Statistics	2013, 4th Edition	Sage Publication

COURSE OUTCOMES: Students will be able to	
CO1	Organize, present and interpret statistical data, both numerically and graphically
CO2	Perform regression analysis, and compute and interpret the coefficient of correlation.
CO3	Use various methods to compute the probabilities of events.
CO4	Analyse and interpret data using appropriate statistical hypothesis and parametric testing techniques.
CO5	Construct control charts and work on tools like SPSS and Excel

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		Credit			Marks		
		L	T	J	EST	CAT	Total
Software Engineering (SEC)	BCA-404	3	1	0	70	30	100

Course Objective	The objective of this course is to enhance knowledge of basic SW engineering methods and practices, and their appropriate application, software designing, testing Strategies and UML models.

Units	Contents (*Theory*)	Hours /week
I	Introduction:- Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Incremental Model, Spiral Model, Rational Unified process and Agile model .	**8**
II	Software Requirement Analysis: Requirement Specifications: Need for SRS, Nature of SRS, Characteristics, Components of SRS. Requirements analysis: Feasibility Study, Information Modeling, IEEE Standards for SRS, Cost Estimation: COCOMO Model, Designing Concepts: Design Principles, Module level concepts- Cohesion and Coupling, Design notations and specifications, Verification, Metrics.	**8**
III	Object Oriented Design: Concepts, Design Notation and Specification, Design methodology, metrics. Debugging Process: Information Gathering, Fault Isolation, Fault Confirmation, Documentation, Fixing fault isolation.	**8**
IV	Testing: Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha and Beta Testing, Testing Object Oriented Programs, Testing Process: Comparison of Different Testing, Level of Testing. Project management for special classes of software projects: Using CASE tools, CBSE.	**8**
V	UML: An overview of UML- UML notations, UML Class diagrams- association, multiplicity, generalization, aggregation, interfaces.	**8**

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Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Ian Sommerville	Software Engineering	9th Edition	Pearson Education Ltd, 2010
Roger S. Pressman	Software Engineering, A Practitioner's approach	7th Edition	McGRAW-HILL Publication, 2010
Pankaj Jalote	An integrated approach to Software Engineering	3rd Edition	Narosa Publishing House, 2013

COURSE OUTCOMES: Students will be able to	
CO1	Understand software development life cycles.
CO2	Understand elicitation process and SRS
CO3	Apply object oriented designing to an application
CO4	Understand testing Strategic
CO5	Prepare UML diagrams

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		Credit			Marks		
		L	T	J	EST	CAT	Total
Management Information System (GEC)	BCA-405	3	1	0	70	30	100

Course Objective	Develop a comprehensive understanding of Management Information Systems (MIS) to effectively leverage technology for organizational decision-making and information management.

Units	Contents (*Theory*)	Hours /week
I	**An Overview Of Management Information Systems (MIS):** Definition and Scope of MIS, Historical Evolution of Information Systems, MIS Vs. Data Processing - MIS & Decision Support Systems - MIS & Information Resources Management - End User Computing MIS Structure - Managerial View of IS Functions of Management - Management Role - Levels of Management.	**8**
II	**Foundation Of Information Systems:** Overview of Information Systems and their role in business.- Fundamentals of Information Systems - Solving Business Problems with Information Systems - Types of Information Systems, Effectiveness and Efficiency Criteria in Information System - Frame Work For IS - Sequence of Development of IS.	**8**
III	**Concept Of Planning & Control:** Concept of Organizational Planning - Planning Process Relationship between planning and organizational success- Computational Support for Planning - Characteristics of Control Process - Nature of Control in an Organization. IS Planning Determination of Information Requirements - Business Systems Planning - End Means Analysis - Organizing the Plan.	**8**
IV	**Business Applications of Information Technology:** Overview of the Internet and its impact on business, Electronic Commerce (E-commerce) fundamentals and its applications in the business environment. - Extranet & Enterprise Solutions - Information System for Business Operations - Information System for Managerial Decision Support - Information System for Strategic Advantage.	**8**
V	**Advanced Concepts in Information Systems:** Overview of Enterprise Resource Planning systems, Integration of business processes through ERP and its benefits. - Supply Chain Management - Customer Relationship Management and Procurement Management - Systems Analysis and Design System Development Life Cycle Prototyping Sad - Project Management - Cost Benefit Analysis - Detailed Design - Implementation.	**8**

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Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
O Brian	Management Information System	10th edition	Tata McGraw-Hill
Gordon B.Davis & Margrethe H.Olson	Management Information System	2nd edition	Tata McGraw-Hill
Murdick	Information System for Modern Management	3rd edition	Prentice Hall (PHI)
Jawadekar	Management Information System	4th edition	Tata McGraw-Hill

COURSE OUTCOMES: Students will be able to

CO1	Apply Management Information Systems (MIS) principles.
CO2	Apply foundational knowledge to understand, analyze, and develop effective Information Systems,
CO3	Implement, and organize Information Systems to support organizational planning and control processes,
CO4	Understand Information Technology for diverse business applications.
CO5	Apply advanced concepts in Information Systems, demonstrating proficiency in their strategic use and implementation.

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Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
		P	J	ESP	CAP	Total
Programming Lab in Java (Major)	BCA-406	2	-	70	30	100

Contents (Practical) :-

1. To demonstrate the usage of Math class.
2. To implement the methods of String class.
3. Implementation of interfaces.
4. Implementation of inheritance.
5. Implementation of super and this.
6. Implementation of static variables and methods.
7. Implementation of Exceptions.
8. To implement multithreading by extending Thread class.
9. To demonstrate File Input Stream and File Output Stream Classes.
10. To demonstrate the creation of applets and passing parameters to applets.

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Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
		P	J	ESP	CAP	Total
Programming Lab in Web Technologies (Minor)	BCA-407	2	-	70	30	100

Contents (Practical):-

1. Creating “Hello world” Application.
2. Creating an Application that displays message based on the screen orientation.
3. Create an application that displays custom designed Opening Screen.
4. Play an audio, based on the user event.
5. Create an UI with all views.
6. Create menu in Application.
7. Read/ write the Local data.
8. Create / Read / Write data with database (SQLite).
9. Create an application to send SMS.
10. Create an application to send an e-mail.
11. Display Map based on the Current/given location.
12. Learn to deploy android Applications.