

**Bachelor of Computer Applications
Semester III**

(For the students admitted from the academic year 2021 – 2022 onwards)

Course: Part III - Core III - Programming in Java	Course Code: 321K03
Semester: III	No. of Credits: 5
No. of hours: 75	C: T - 65:10
CIA Max. Marks: 50	ESE Max. Marks:50

(C: Contact hours, T: Tutorial)

Course Objectives:

- To interpret the fundamental concepts of Object-Oriented Technology and the power of Java Language.
- To apply the concept of classes, objects, invoking methods etc and exception handling mechanisms.
- To compute the principles of inheritance, packages and interfaces.

Course Outcomes: On completion of the Course the student will be able to

CO	Statement	Bloom's Taxonomy level
CO1	Reveal the basic object-oriented programming concepts and apply the concepts like data types, variables, constants and operators.	U
CO2	Implement the concepts like Control statements, Arrays, Class, Object, Inheritance and Polymorphism.	A
CO3	Construct a program using the concepts of Interface, Packages and Applets.	A
CO4	Design and develop programs using Applets to handle various exceptions	U
CO5	Classify the ideas of threads and its life cycle.	A

U –Understanding A-Apply

Syllabus:

Unit I:	13
Hrs	
Introduction: Evolution of Java Language – About the Java Platform – Java Development Kit - Features of Java – Object Oriented Programming in Java – Structure of a Java Program – How to write a Simple Java program.	
The Programming Basics: Introduction - Character Set - Tokens – Constants – Data Types – Variables – Operators - Arithmetic Expressions - Automatic Type Conversion in Expressions - Operator Precedence and Associativity.	

Unit II:	13
Hrs	
Control Statements – Introduction – Decision-Making Statements – Looping Statements – Branching Statements. Arrays and Methods – Introduction – Types of Arrays – Methods – Method Overloading – Recursion. Classes and Objects: Introduction- General form of a class - Creation of Objects -Usage of Constructors - this keyword - Copy constructors.	

Unit III:	13
Hrs	
<p>Inheritance and Polymorphism: Introduction - Inheriting the variables in a Class - Inheriting the Methods in a Class - Inheritance and Constructors - Abstract Classes - Final Classes.</p> <p>Interfaces and Packages: Introduction - Interfaces: Structure of an Interface - Implementation of an Interface. Packages – Package Hierarchy – import Statement.</p>	

Unit IV:	13 Hrs
<p>Applets & AWT – Introduction – Life Cycle of an Applet – Applet Class – Development and Execution of a simple Applet. Abstract Windowing Toolkit – Label Control – Button Control – CheckBox Control - Radio Button Control – Choice Control – List Control – Scrollbar – Layouts – Panel - Windows and Frames - Menus – Dialog.</p>	

Unit V:	13 Hrs
<p>Multithreading: Introduction - Life Cycle of a Thread - Creating and Running Threads –Runnable Interface- Methods in the Thread Class - Synchronization - Deadlock – Inter-thread Communication - Applets Involving Threads.</p> <p>Exception Handling: Introduction - Default Exception Handling – User Defined Exception Handling Mechanism - Exception and Error Classes – Types of Exception - Finally Block - throw Statement– throws Clause - Difference between throw and throws Exception.</p>	

Book for Study:

Unit	Name of the Book	Authors	Publishers with Edition
I - V	Java: Novice to Experts	B. Iswarya K. Manimekalai	Lambert Academic Publishing 2021.

Books for Reference:

S. No	Unit	Name of the Book	Authors	Publishers with Edition
1.	I - IV	Programming in Java	Sachin Malhotra Saurabh Choudhary	Oxford University Press, First Edition, 2010.
2.	V	Programming in Java A Primer	E.Balagurusamy	4e, Tata McGraw Hill Education Private Ltd, 2010.

E-Resources: (Web resources & E-books)

1. Spoken Tutorial Project Java as e-Resource for Learning -IIT, Mumbai under National Mission on Education through ICT, MHRD, Govt. of India.
2. <http://www.cs.tau.ac.il/~msagiv/courses/wcc06/JavaTutorials.ppt>
3. https://www.tutorialspoint.com/java/java_tutorial.pdf

Mapping of Course Outcome with PO's and PSO's

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	Bloom's Taxonomy level
CO 1	H	M	H	M	-	-	-	-	H	H	H	U
CO 2	H	M	H	M	-	-	-	-	H	H	H	A
CO 3	H	M	H	M	-	-	-	-	H	H	H	A
CO 4	H	M	H	M	-	-	-	-	H	H	H	U
CO 5	H	M	H	M	-	-	-	-	H	H	H	A

Correlation Level: H-High, M-Moderate, L-Low

**Bachelor of Computer Applications
Semester IV**

(For the students admitted from the academic year 2021 – 2022 onwards)

Course: Part III – Core VI - .Net Programming	Course Code: 421K06
Semester: IV	No. of Credits: 4
No. of hours :60	C: T - 52:8
CIA Max. Marks: 50	ESE Max. Marks:50

(C: Contact hours, T: Tutorial)

Course Objectives:

- To recognize .NET framework and describe some of the major enhancements to the new version of VB.
- To describe the basic structure of a VB.NET and use main features of the integrated development environment (IDE).
- Identify various web applications, users and dynamic web services.
- To design an ASP.Net application.

Course Outcomes: On completion of the Course the student will be able to

CO	Statement	Bloom's Taxonomy level
CO1	State Dot Net's integrated development environment (IDE), implement the concept of object-oriented programming and usage of operators.	R
CO2	Use conditional statements, loops for program development and arrays to create manageable codes.	A
CO3	Implement the concepts of procedures and structures to work with multiple document interfaces (MDI) forms.	A
CO4	Demonstrate ASP.Net objects and their interactivity	A
CO5	Interpret the concepts of SQL and its commands for query building.	A

R-Remembrance A-Apply

Syllabus:

Unit I: **10 Hrs**

Introducing .NET: .NET Framework Overview - .NET Framework Class Library, Languages in .NET, Visual Studio.Net – Why VB. NET?

Data Types and Operators: Data Types – Declaration of Variables – Constant - Operators – Arithmetic Operators – Concatenation Operators – Relational Operators – Compound Assignment Operator – Logical Operators – Bitwise Operators – Scope of variables.

Unit II: **10 Hrs**

Control Statements: If Statement – Block-if – Nested ifs – Looping – Select-Case Statement – Goto Statement – Form Control – Events – Label – Text Box – Group Box Control – Check Box Control – Radio Button Control – Scroll Bar Control – Timer- Picture Box- Link Label - Arrays.

Unit III: **10 Hrs**

Procedures and Structures: Functions –Functions with Arrays – Functions with Param Arrays - Function Overloading – Sub Procedures – Invoking a Sub Procedures – Structure – Nested Structures – Message Box function – Input Box Function.

Creating Menus and using Dialog boxes: Menus – Multiple Document Interface forms – Context menu – Rich Text Box – Color Dialog Control – Font Dialog Control.

Unit IV: **11 Hrs**

Programming ASP.NET with Visual Basic .NET: Built-in ASP.NET Objects and Interactivity – The Response Object – The ASP Server Object.

ASP.NET Configuration, Scope and State: ASP.NET and Configuration – ASP.NET and State – The Application Object – ASP Sessions – The Session Object.

Unit V: **11 Hrs**

ASP.NET and SQL Server: Using SQL Server – Using Databases in ASP.NET Applications – ActiveX Data Objects – The ADO.NET Object Model – Coding Structured Query Language (SQL).

Books for Study:

S. No	Unit	Name of the Book	Authors	Publishers with Edition
1.	I – III	VB.NET	P.Radhaganesan	Scitech Pub Pvt Ltd, Chennai. Reprint March 2014.
2.	I V, V	ASP.NET A Beginner's Guide	Dave Mercer	Tata McGraw Hill, Sixth Reprint 2008.

Books for Reference:

S. No	Unit	Name of the Book	Authors	Publishers with Edition
1.	I - V	Murach's Visual Basic 2012	Anne Boehm	Mike Murach & Associates, Incorporated, 2013.
2.	I - V	ASP.NET: The Complete Reference	Macdonald (Matthew)	Tata McGraw Hill Publishing Company Ltd., First Edition, 2006.

E-Resources: (Web resources & E-books)

1. www.kciti.edu/wp-content/uploads/2017/07/vb.net_tutorial.pdf
2. https://www.visualchart.com/ContentManagement/Development/Manuals/EN/vbNet_programming.pdf
3. https://www.tutorialspoint.com/asp.net/asp.net_tutorial.pdf
4. <https://s3.amazonaws.com/recaffeinate-files/LittleAspNetCoreBook.pdf>

Mapping of Course Outcome with PO's and PSO's

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	Bloom's Taxonomy level
CO 1	H	M	H	M	-	-	-	-	H	H	H	R
CO 2	H	M	H	M	-	-	-	-	-	M	-	A
CO 3	H	M	H	M	-	-	-	-	H	H	H	A
CO 4	H	M	H	M	-	-	-	-	-	M	-	A
CO 5	H	M	H	M	-	-	-	-	H	H	-	A

Correlation Level: H-High, M-Moderate, L-Low

Bachelor of Computer Applications**Semester IV**

(For the students admitted from the academic year 2021 – 2022 onwards)

Course: Part III - Core VII - Relational Database Management System	Course Code: 421K07
Semester: IV	No. of Credits: 5
No. of hours :75	C: T– 65:10
CIA Max. Marks: 50	ESE Max. Marks:50

(C: Contact hours, T: Tutorial)

Course Objectives:

- To manage large amount of information using the basic concepts of Database and Relational Database Management System.
- To examine the concept of data storage and maintenance.

Course Outcomes: On completion of the Course the student will be able to

CO	Statement	Bloom's Taxonomy level
CO1	Identify the basic database design and appreciate its applications.	R
CO2	Examine the concept of relational algebra expressions using queries.	U
CO3	Summarise the basics of SQL and query a database using SQL commands.	U
CO4	Apply a database schema for any commercial problem domain using E-R model.	A
CO5	Implement the normalization theory in a database and utilize the concept of Functional Dependencies.	A

R-Remembrance U –Understanding A-Apply**Syllabus:**

<p>Unit I: 13 Hrs</p> <p>Introduction: Database-System Applications - Purpose of Database Systems - View of Data - Database Languages - Relational Databases - Database Design - Data Storage and Querying – Transaction Management - Database Architecture – Data Mining and Information Retrieval - Database Users and Administrators - History of Database Systems.</p> <p>Introduction to the Relational Model: Structure of Relational Databases – Database Schema – Keys – Relational Query Languages – Relational Operations.</p>
<p>Unit II: 13 Hrs</p> <p>Introduction to SQL: Overview of the SQL Query Language – SQL Data Definition – Basic Structure of SQL Queries – Set Operations – Null Values – Aggregate Functions – Nested Sub Queries.</p>
<p>Unit III: 13 Hrs</p> <p>Intermediate SQL: Join Expressions – Views – Transactions – Integrity Constraints – SQL Data Types and Schemas – Authorization.</p> <p>Advanced SQL: Accessing SQL From a Programming Language – Functions and Procedures – Triggers.</p> <p>Formal Relational Query Languages: The Relational Algebra – The Tuple Relational Calculus – The Domain Relational Calculus.</p>
<p>Unit IV: 13 Hrs</p> <p>Database Design and the E-R Model: Overview of the Design Process – The Entity-Relationship Model – Constraints – Removing Redundant Attributes in Entity Sets - Entity-Relationship Diagrams – Reduction to Relational Schemas - Entity-Relationship Design Issues – Extended E-R Features.</p>
<p>Unit V: 13 Hrs</p> <p>Relational Database Design: Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition Using Functional Dependencies – Functional-</p>

Dependency Theory – Decomposition Using Multivalued Dependencies – More Normal Forms
– Database-Design Process – Modelling Temporal Data.

Book for Study:

Unit	Name of the Book	Authors	Publishers with Edition
I – V	Database System Concepts	Abraham Silberschatz, Henry F. Korth, S.Sudarshan	McGraw-Hill, Sixth Edition, Fifth Reprint 2014.

Books for Reference:

S. No	Unit	Name of the Book	Authors	Publishers with Edition
1.	I - V	Introduction to Database Management Systems	AtulKahate	Dorling Kindersley Ltd., First Edition, 2012.
2.	I - V	Database Management System: A Practical Approaches	Ravi Chopra	S.Chand &Co. Ltd., First Edition, 2010.

E-Resources: (Web resources & E-books)

1. https://docs.oracle.com/cd/E11882_01/server.112/e40540.pdf
2. www.rjspm.com/PDF/BCA-428%20Oracle.pdf
3. www.kciti.edu/wp-content/uploads/2017/07/dbms_tutorial.pdf

Mapping of Course Outcome with PO's and PSO's

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CO 1	H	M	H	M	-	-	-	-	H	M	-	R
CO 2	H	M	H	M	-	-	-	-	M	M	-	U
CO 3	H	M	H	M	-	-	-	-	H	M	-	U
CO 4	H	M	H	M	-	-	-	-	M	-	H	A
CO 5	H	M	H	M	-	-	-	-	M	-	H	A

Correlation Level: H-High, M-Moderate, L-Low

**Bachelor of Computer Applications
Semester IV**

(For the students admitted from the academic year 2021 – 2022 onwards)

Course: Part IV - Skill Enhancement Course II – Automation Testing	Course Code: 421KS2
Semester: IV	No. of Credits: 2

No. of hours: 45	P: R: 38:7
CIA Max. Marks: 100	

(P: Practical, R: Record work)

Course Objectives:

- To understand software test automation problems and solutions.
- To gain the techniques and skills on how to use modern software testing tools to support software testing projects.
- To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

Course Outcomes: On completion of the Course the student will be able to

CO	Statement	Bloom's Taxonomy level
CO 1	Ability to design and conduct a software test process for a software testing project.	A
CO 2	Identify the needs of software test automation, and define and develop a test tool to support test automation.	A
CO 3	Ability to identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.	A

A-Apply

Syllabus:

List of Programs

1. Understand the Automation Testing Approach.
2. Using Selenium IDE, write a test suite containing minimum 4 test cases.
3. Understanding Test Automation. Using Selenium write a simple test script to validate each field of the registration page (Job Registration Page)
4. Conduct a test suite for any two web sites.
5. Write and test a program to login a specific web page.
6. Write test cases to validate a mobile number using One Time Pin Identification (OTP).
7. Write and test a program to find out list of employees having salary greater than Rs 50,000 and age between 30 to 40 years.
8. Write and test a program to update student records into table into Excel file.
9. Write and test a program to select the number of students who have scored more than 50.
10. Write and test a program to provide total number of objects present / available on the page.
11. Write and test a program to count number of items present on a desktop.
12. Test Cases: Admission form, Shopping cart, Travel Booking, Hotel Booking, Electricity Bill Payment.

Mapping of Course Outcome with PO's and PSO's

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	Bloom's Taxonomy level
CO 1	H	M	H	M	-	-	-	-	H	H	H	A
CO 2	H	M	H	M	-	-	-	-	H	H	H	A
CO 3	H	M	H	M	-	-	-	-	H	H	H	A

Correlation Level: H-High, M-Moderate, L-Low

Bachelor of Computer Applications

Semester V

(For the students admitted from the academic year 2021 – 2022 onwards)

Course: Part IV - Skill Enhancement Course III – Animation Techniques	Course Code: 521KS3
Semester: V	No. of Credits: 2
No. of hours :45	P: R – 38:7
CIA Max. Marks: 100	

(P: Practical, R: Record work)

Course Objectives:

- To extrapolate the fundamental knowledge of 2D animation techniques.
- To develop the intermediate skills using special effects, animation and Action Scripts.

Course Outcomes: On completion of the Course the student will be able to

CO	Statement	Bloom's Taxonomy level
CO1	Perform animated digital multimedia content using tools and techniques like tween and motion to morph shapes.	A
CO2	Design layers, backgrounds that incorporates principles of speed, color and accuracy.	A
CO3	Construct the knowledge of manipulating, morphing, editing, graphics, text, action scripts, libraries and use various tools of interactive animations.	A

A-Apply

Syllabus:

List of Programs

1. Draw a butterfly using oval tool, Circle tool and Pencil tool.
2. Create a shape with Pencil tool (Using Straight smooth and free form lines).
3. Draw a Pentagon using Vector Graphics Method.
4. Create a Drop Shadow effect with depth.
5. i) Create a text along a curved path. ii) Draw a 3D ring.
6. Create a 3D Tunnel
7. Draw a picture in multiple frames using Onion Skin Effect.
8. Create animated button with a gradient in the upstate and a text over it.
9. Create folders in the library with names, eyes, heads, mouth and nose. Create symbols with different types of eyes, head etc., and store in the corresponding folders. Using those symbols assemble different types of Faces.
10. Using multiple motion tweening effect, draw a pendulum.

Mapping of Course Outcome with PO's and PSO's

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	Bloom's Taxonomy level
CO 1	H	M	H	M	-	-	-	-	H	H	H	A
CO 2	H	M	H	M	-	-	-	-	H	H	H	A
CO 3	H	M	H	M	-	-	-	-	H	H	H	A

Correlation Level: H-High, M-Moderate, L-Low