Lingaya's Vidyapeeth

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NAAC ACCREDITED
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Nachauli, Jasana Road, Faridabad- 121002 (Haryana)
Website: www.lingayasvidyapeeth.edu.in | Ph: 0129-2598200-05

COURSE PLAN & COURSE DATA SHEET

PROGRAM: B.Tech	DEGREE:
COURSE: Object Oriented Programming using Java	SEMESTER: II CREDITS: 3
COURSE CODE: CS-106 REGULATION:	COURSE TYPE: CORE
COURSE AREA/DOMAIN:	CONTACT HOURS: 3 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY): CC-156	LAB COURSE NAME (IF ANY): Object Oriented Programming using Java Lab

PROGRAM EDUCATIONAL OBJECTIVES:

SYLLABUS:

UNIT	DETAILS	HOURS
I	INTRODUCTION TO JAVA, DATA TYPE, VARIABLES, ARRAY : Basic Concepts of OOP and its Benefits; Application of OOP; Features of Java; Different types of data types, Literals, Variables, Type conversion and casting :Java's automatic type conversion, Casting incompatible types; Automatic type promotion in expression; Arrays: One-Dimensional Arrays, Multidimensional Arrays, Alternative Array Declaration Syntax.	7
II	**STRINGS, OPERATORS, EXPRESSION, CONTROL STATEMENTS:** String handling: String class, Different string operations, String comparison ,Searching and modifying a string, Using string buffer class, Vector & Wrapper classes Different types of operators: arithmetic, bitwise, logical, relational, Boolean, assignment, conditional, special; Operator precedence and associatively; Using parentheses; Expression; Solving an expression; Control statements: if-else, nested if-else switch; Iteration statements: while, do-while, for, nested loops Jump Statements: using break, using continue, return.	7
III	INHERITANCE, INTERFACES, PACKAGE : Inheritance: Different types of Inheritance, super keyword, Method overriding, Different types of access specifiers Defining Interface, Extending & Implementing interfaces, implementing multiple inheritance, Package: Java API Packages, Using System Package, Naming Conventions, Creating package, Accessing a package, using your own package.	7
IV	**MULTITHREADING, EXCEPTION HANDLING & APPLET PROGRAMMING**: Multithreading: The Java Thread Model, Creating a Thread: extending Thread class and implementing Runnable interface, life cycle of a thread, using Thread methods, Thread exception Thread priority, Synchronization Exception: Exception Handling mechanism , Multiple catch statements , Using finally statements , throwing our own exception; Applet: Local & Remote Applets ,Steps to write & running Applets, Applet life cycle, Passing parameters, Displaying numerical values, getting input from the user.	9
V	GRAPHICS PROGRAMMING & FILE HANDLING: Graphics class: Lines & Rectangle, Circles & Ellipses, Arcs, Polygons, Line Graphs, Bar Charts; File Handling: Stream Classes: Character & Byte Stream Class, I/O Exceptions, Reading /Writing character, Reading /Writing bytes, Concatenating & buffering files, Random Access Files.	9
	TOTAL HOURS	39

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Teacher Centric Approach			
TC1: Chalk and Talk, Blended learning	TC2: PPT,	TC3: Video Lectures	TC4:
Learner Centric Approach:			
LC1: Assignment.	LC2: Mini project.	LC3: Quiz/Class test.	LC 4: Seminar on recent trends.
LC5: Group Task.	LC6: Others		

DETAILED SESSION PLAN

Lecture session/ Number	Topics to be covered	CO addressed	Teacher Centric Approach	Learner Centric Approach	References	Relevance with POs and PSOs
1	**UNIT-1** Introduction to java, data type, variables.	CO1	TC1, TC2	LC1/LC2	T2	
2	Basic Concepts of OOP and its Benefits; Application of OOP.	CO1	TC1, TC2	LC1/LC2	T2	
3	Features of Java; Different types of data types, Literals,	CO1	TC1, TC2	LC1/LC2	T2	
4	Type conversion and casting: Java's automatic type conversion, Casting incompatible types; Automatic type promotion in expression.	CO1	TC1, TC2	LC1/LC2	T2	
5	Arrays: One-Dimensional Arrays	CO4	TC1, TC2	LC1/LC2	T2	
6	Arrays: Multidimensional Arrays, Alternative Array Declaration Syntax.	CO4	TC1, TC2	LC1/LC2	T2	

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7	Doubt class				
8	**UNIT-2 STRINGS, OPERATORS, EXPRESSION, CONTROL STATEMENTS:** String handling: String class, Different string operations, String comparison ,Searching and modifying a string.	CO2	TC1, TC2	LC1/LC2	T2
9	Using string buffer class, Vector & Wrapper classes.	CO2	TC1, TC2	LC1/LC2	T2
10	Different types of operators: arithmetic, bitwise, logical, relational, Boolean, assignment,	CO2	TC1, TC2	LC1/LC2	T2
11	Operator precedence and associatively; Using parentheses; Expression; Solving an expression.	CO2	TC1, TC2	LC1/LC2	T2
12	Control statements: if-else, nested if-else switch-case.	CO2	TC1, TC2	LC1/LC2	T2
13	Iteration statements: while, do-while, for, nested loops Jump Statements: using break, using continue, return.	CO2	TC1, TC2	LC1/LC2	T2
14	Revision Class				

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15	**UNIT-3 INHERITANCE, INTERFACES, PACKAGE:** Inheritance: Different types of Inheritance.	CO3	TC1, TC2	LC1/LC2	T2
16	Super keyword, Method overriding	CO3	TC1, TC2	LC1/LC2	T2
17	Different types of access specifiers	CO3	TC1, TC2	LC1/LC2	T2
18	Defining Interface, Extending & Implementing interfaces implementing multiple inheritance	CO3	TC1, TC2	LC1/LC2	T2
19	Package: Java API Packages, Using System Package, Naming Conventions,	CO3	TC1, TC2	LC1/LC2	T2
20	Accessing a package, using your own package.	CO3	TC1, TC2	LC1/LC2	T2
21	Revision Class				
22	**UNIT-4 MULTITHREADING,**	CO3	TC1, TC2	LC1/LC2	T2
23	Creating a Thread: extending Thread class and implementing Runnable interface, life cycle of a thread.	CO3	TC1, TC2	LC1/LC2	T2

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24	Thread exception Thread priority	CO4	TC1, TC2	LC1/LC2	T2
25	Synchronization Exception: Exception Handling mechanism	CO3	TC1, TC2	LC1/LC2	T2
26	Multiple catch statements , Using finally statements , throwing our own exception	CO3	TC1, TC2	LC1/LC2	T2
27	Applet: Local & Remote Applets Steps to write & running Applets	CO3	TC1, TC2	LC1/LC2	T2
28	Applet life cycle, Passing parameters	CO3	TC1, TC2	LC1/LC2	T2
29	Displaying numerical values, getting input from the user.	CO3	TC1, TC2	LC1/LC2	T2
30	Revision Class				
31	**UNIT-5 GRAPHICS PROGRAMMING & FILE HANDLING:**	CO4	TC1, TC2	LC1/LC2	T2
32	Arcs, Polygons, Line Graphs, Bar Charts	CO4	TC1, TC2	LC1/LC2	T2
33	File Handling: Stream Classes:	CO4		LC1/LC2	

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34	I/O Exceptions, Reading /Writing character	CO4	TC1, TC2	LC1/LC2	T2	
35	I/O Exceptions, Reading /Writing character	CO4	TC1, TC2	LC1/LC2	T2	
36	Reading /Writing bytes	CO4	TC1, TC2	LC1/LC2	T2	
37	Concatenating & buffering files	CO4	TC1, TC2	LC1/LC2	T2	
38	Random Access Files.	CO4	TC1, TC2	LC1/LC2	T2	
39	Revision Class					

TEXT/REFERENCE BOOKS:

T/R	
T1	Herbert Schildt , "The Complete Reference Java 2 fifth edition, McGraw Hill.
T2	Balaguruswamy , E., ""Programming with Java", Tata Mcgraw Hill.
R1	Horetmann Cay and Cornell Gary, "Core Java Volume – I", Pearson Education.
R2	Horetmann Cay and Cornell Gary, "Core JavaTM 2, Volume II – Advanced Features", 7th Edition, Pearson Publisher.
R3	Kathy Sierra and Bert Bates, "Head First Java" by O'REILLY publications.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
ESC-101	**Programming for Problem Solving**	**Concepts of C Programming**	**I**

COURSE OBJECTIVES:

1	To introduce the basic concepts of Java and its data types
2	To gain knowledge about the control flow statement, iterations and classes in Java
3	To become familiar with topics like inheritance and packages
4	To use enumerations, arrays, multithreading, exceptions and byte streams with ease

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COURSE OUTCOMES:

S.NO	DESCRIPTION	PO(1..12) MAPPING	PSO(1..3) MAPPING
CO 1	Students will be able to: get accustomed to the Java architecture, Java Virtual Machine, Java runtime environment, setting the path environment variables, defining variables, datatypes, identifiers, keywords, strings, operators, properties of operators	PO1,PO2,PO3,PO5,PO6	PSO1
CO 2	Students will be able to: Use the If, If...Else, Switch...Case statements, while, do ... while, for, for each loop, labeled statements, Break And Continue Statements, Return Statement, Types of Classes, initializing the class object And Its attributes, class methods, accessing a method, method's arguments, method overloading, static fields and methods of a class, garbage collection	PO1,PO2,PO3,PO5,PO6	POS1,PSO2
CO 3	Students will be able to: become familiar with derived class objects, this and super keywords, abstract classes, methods and interfaces, implementing Interfaces, creating packages, default package, importing packages	PO1,PO2,PO5,PO6,PO8,PO12	PSO1,PSO2,PSO3
CO 4	Students will be able to: make use of two dimensional arrays, multi-dimensional arrays, adding, accessing, searching for elements in a vector, study the thread life cycle, catch and handle run-time exceptions, use the finally and throws clause, read and write console output, read and write binary data and character streams from and to a file respectively	PO1,PO2,PO4,PO5,PO6,PO9,PO12	PSO1,PSO3

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COURSE OVERALL PO/PSO MAPPING:		PO1,PO2,PO

COURSE OUTCOMES VS POs MAPPING (DETAILED; HIGH: 3; MEDIUM:2; LOW:1**):**

S.NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	1	1		1	1							3		
CO.2	2	1	1		3	1								1	2
CO.3	1	1			1	1		1				1	1	1	1
CO.4	1	1		1	1	1			1			1	1		1
CO.5															

* For Entire Course, PO & PSO Mapping

POs & PSO REFERENCE:

PO1	Engineering Knowledge	PO7	Environment & Sustainability	PSO1	To equip the students with theoretical and implementation knowledgebase in all the latest areas of Computer Science & Engineering for a successful career in software industries, pursuing higher studies, or entrepreneurial establishments.
PO2	Problem Analysis	PO8	Ethics	PSO2	To nurture the students with the critical thinking abilities for better decision making by offering them a socially acceptable solutions to real life problems through computing paradigm.
PO3	Design & Development	PO9	Individual & Team Work	PSO3	To nurture the students with the comprehensive analytical and design abilities by offering them techno-commercially feasible solutions of real business problems through computing.
PO4	Investigations	PO10	Communication Skills		
PO5	Modern Tools	PO11	Project Mgt. & Finance		
PO6	Engineer & Society	PO12	Life Long Learning		

COs VS POs MAPPING JUSTIFICATION:

S.NO	PO/PSO MAPPED	LEVEL OF MAPPING	JUSTIFICATION
Cxxx.1			
Cxxx.2			
Cxxx.3			
Cxxx.4			
Cxxx.5			
Cxxx*			

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS, POs & PSOs:

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SNO	DESCRIPTION	PROPOSED ACTIONS
1		
2		
3		
4		
5		

PROPOSED ACTIONS: TOPICS BEYOND SYLLABUS/ASSIGNMENT/INDUSTRY VISIT/GUEST LECTURER/NPTEL ETC

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

1	
2	

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

☐ CHALK & TALK	☐ STUD. ASSIGNMENT	☐ WEB RESOURCES	☐ NPTEL/OTHERS
☐ LCD/SMART BOARDS	☐ STUD. SEMINARS	☐ ADD-ON COURSES	☐ WEBNIARS

ASSESSMENT METHODOLOGIES-DIRECT

☐ ASSIGNMENTS	☐ STUD. SEMINARS	☐ TESTS/MODEL EXAMS	☐ UNIV. EXAMINATION
☐ STUD. LAB PRACTICES	☐ STUD. VIVA	☐ MINI/MAJOR PROJECTS	☐ CERTIFICATIONS
☐ ADD-ON COURSES	☐ OTHERS		

ASSESSMENT METHODOLOGIES-INDIRECT

☐ ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE)	☐ STUDENT FEEDBACK ON FACULTY (TWICE)
☐ ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS	☐ OTHERS

INNOVATIONS IN TEACHING/LEARNING/EVALUATION PROCESSES:

1. **Technology Integration:** Embrace and integrate technology tools in the classroom to enhance the learning experience. This can include interactive whiteboards, educational apps, virtual reality, and online collaboration platforms. Utilizing technology allows for more dynamic and interactive lessons, catering to diverse learning styles.
2. **Personalized Learning Paths:** Implement personalized learning approaches that cater to individual student needs and pace of learning. Adaptive learning platforms and data analytics can help tailor educational content, assignments, and assessments based on the strengths and weaknesses of each student, promoting a more customized learning experience.
3. **Active Learning Strategies:** Move away from traditional lecture-based approaches and incorporate active learning strategies. This involves engaging students in hands-on activities, group discussions, problem-solving exercises, and real-world projects. Active learning fosters critical thinking, collaboration, and practical application of knowledge.
4. **Blended Learning Models:** Adopt blended learning models that combine face-to-face instruction with online resources. This allows for flexibility in learning, enabling students to access materials at their own pace outside the classroom. Flipped classrooms, where students learn new concepts online and engage in discussions and activities during class, are an example of a blended learning approach.
5. **Assessment Innovation:** Rethink assessment methods to go beyond traditional exams and quizzes. Explore alternative forms of assessment, such as project-based assessments, portfolios, presentations, and peer assessments. Additionally, incorporate formative assessments and feedback throughout the learning process to help students track their progress and make improvements.

Prepared by   **Approved by**

(Ms. Komal Malsa)   **(HOD)**

 # Additionally, the details to be compiled separately by the Departmental Coordinator for the entire Department.