

***VISION:** To be a department of repute offering programmes in frontier areas of IT through quality education, research and imbibing societal values.*



KALASALINGAM
ACADEMY OF RESEARCH AND EDUCATION
(DEEMED TO BE UNIVERSITY)



Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A" Grade
Anand Nagar, Krishnankoil - 626126. Srivilliputtur (Via), Virudhunagar (Dt), Tamil Nadu | info@kalasalingam.ac.in | www.kalasalingam.ac.in

SCHOOL OF COMPUTING
DEPARTMENT OF INFORMATION TECHNOLOGY

Object Oriented Programming using Java
(212INT2304)

Course Plan
Academic Year 2022-2023
EVEN Semester

Bachelor of Technology in Information Technology

Prepared by
Mr.S.Kailasam,
Assistant Professor/IT

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UNIVERSITY VISION	UNIVERSITY MISSION
To be a Centre of Excellence of International Repute in Education and Research.	To Produce Technically Competent, Socially Committed Technocrats and Administrators through Quality Education and Research

DEPARTMENT OF INFORMATION TECHNOLOGY	
DEPARTMENT VISION	DEPARTMENT MISSION
To be a department of repute offering programmes in frontier areas of IT through quality education, research and imbibing societal values.	<p>To provide quality education through effective curriculum and innovative teaching.</p> <p>To facilitate conducive learning environment for students and faculty to investigate, apply and transfer knowledge.</p> <p>To instill the ethical behavior and social responsibilities to provide sustainable information technology solutions.</p>

PROGRAMME EDUCATIONAL OBJECTIVES
<p>PEO-1: The graduates are trained to gain employment as an IT professional and to pursue higher studies to cater the global needs.</p> <p>PEO-2: The graduates could comprehend, analyze, design and create novel products and technologies that provide solution to real world problems.</p> <p>PEO-3: The graduates acquire multidisciplinary knowledge with ethical standards, effective communication skills and management skills to work as part of teams on all diverse professional environments.</p>

PROGRAMME SPECIFIC OUTCOMES
<p>PSO1. Ability to identify, design and develop processes and systems for enterprises</p> <p>PSO2. Ability to identify, deploy and maintain the IT infrastructure based on the needs of the businesses</p> <p>PSO3. Practice and promote information technologies for societal needs</p>

PROGRAMME OUTCOMES
<p>At the end of the programme, the students will be able to:</p> <ol style="list-style-type: none"> Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Conduct investigations of complex problems: Use research-based knowledge and research

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- methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
 6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
 7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
 8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
 9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
 10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
 11. **Project management and finance:** Demonstrate knowledge and understanding of the Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
 12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

ABET Student Outcomes ASOs – Computing

At the end of the programme, the students will be able to:

- AO1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- AO2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- AO3. Communicate effectively in a variety of professional contexts.
- AO4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- AO5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- AO6. Identify and analyse user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems.

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SYLLABUS

212INT2304	Object Oriented Programming Using Java	L	T	P	X	C
		3	0	2	0	4

UNIT I: OOP Basics

JAVA BASICS: Review of Object oriented concepts, History of Java, Java buzzwords, JVM architecture, Data types- Variables, Scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors- methods, Static block, Static Data, Static Method, String and String Buffer Classes, Using Java API Document.

UNIT II: Inheritance, Packages and Interfaces

Basic concepts, Types of inheritance, Member access rules, Usage of this and Super key word, Method Overloading.- Method overriding, Abstract classes, Dynamic method dispatch, Usage of final keyword. Defining package, Access protection, importing packages; Defining and Implementing interfaces, and Extending interfaces.

UNIT III: Exception Handling, I/O and Multithreading

Concepts of Exception Handling - Benefits of Exception Handling Exception types, Usage of Try, Catch, Throw, Throws and Finally keywords- Built-in Exceptions, Creating own Exception classes, Input/Output: The I/O Classes and Interfaces, I/O Exceptions, Stream classes, Concepts of Thread, Thread life cycle- creating threads using Thread class and Runnable interface, Synchronization, Thread priorities, Inter Thread communication

UNIT IV: Event Handling

Events: Event Sources, Event Classes, Event Listeners, Delegation Event Model, Handling Mouse and Keyboard Events, Adapter Classes; **AWT:** The AWT Class Hierarchy, User Interface Components- Labels, Button, Canvas, Scrollbars, Text Components, Check Box, Check Box Groups, Choices, Lists Panels – Scrollpane, Dialogs, Menubar, Graphics, Layout Managers – Flow Layout, Border Layout, Grid Layout and Card Layout, Menu Bars and Menus.

UNIT V: GUI Programming with Swing

Swing: Introduction, Limitations of AWT, MVC Connection, Components and Containers, **Exploring Swing:** JLabel and ImageIcon, JTextField, The Swing Buttons- JButton, JToggleButton, Check Boxes and Radio Buttons, JApplet, JScrollPane, JList, JComboBox, Trees and JTable. **Introducing Swing Menus-** Menu Basics, Overview of JMenuBar, JMenu and JMenuItem, Create a Main Menu.

TEXT BOOK

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1. Herbert Schildt, The Complete Reference - Java, Tata McGraw-Hill Education, Eleventh Edition, 2019.
2. Paul J. Deitel, Harvey Deitel ,Java SE8 for Programmers (Deitel Developer Series) 3rd,Edition, 2014
3. Y.Daniel Liang, Introduction to Java programming – comprehensive version-Tenth Edition, Pearson Ltd 2015.
4. E.Balagurusamy. "Programming with JAVA A primer", Tata McGraw Hill Publication company, fourth edition, 2010

REFERENCES

1. Paul Deitel Harvey Deitel, Java - How to Program, Prentice Hall; 9th edition, 2011.
2. Cay Horstmann BIG JAVA,4th Edition, John Wiley Sons, 2009
3. Nicholas S.Williams, Professional Java for Web Applications, Wrox Press,2014
4. T. Budd (2009), An Introduction to Object Oriented Programming, Addison Wesley Longman, 2002

LIST OF EXPERIMENTS:

S.No	Experiments
1	Basic Java Programming
2	Programs using Objects and Classes
3	Programs using Array and String
4	Programs using Static data, Static block and Static Method
5	Programs using Inheritance
6	Programs using Interface
7	Programs using Exception Handling
8	Programs using Stream Classes
9	Programs using Multithreading
10	Programs using Event Handling
11	Programs using AWT
12	Programs using Swings and Swing Menus
13	Additional Experiments if any

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COURSE PLAN

Course Name/Code	Object Oriented Programming using Java/212INT2304
Degree/Branch	B.Tech/IT
Course Credit	4
Course Category	Program Core – Integrated Course with Theory
Year/Semester	II/IV
Course Instructor(s)	Mr.S.Kailasam
Course Coordinator	Mr.S.Kailasam
Module Coordinator	Mr.S.Kailasam
Program Coordinator	Dr.R.Sundarrajan

Course Description:

This course introduces object-oriented programming using the Java programming language. Students will learn how to program in Java and use some of its most important APIs. Special importance will be assigned to the object-oriented nature of Java and its use of polymorphism. Hands-on labs and exercises will enable students toward becoming highly skilled Java Application developers.

Career Opportunities:

Java is typically used for fairly High-level development. It is used in embedded systems, which is often listed as a computer engineering position (rather than computer science, or software engineering.). Java is also used for device drivers and Graphical math utility code for larger projects and used for development of browsers, instant messengers, server daemons, and network code. Graduates may work as team members to analyze business requirements, design, develop, and implement appropriate web solutions to the user community. The graduates of this program will find employment in both small-size and mid- size business as well in larger enterprises. Graduates may find jobs that involve developing or designing web pages, and working with computer programming languages. These skills may be used to supplement a career choice, or may be used to obtain the following entry- level job titles:

- Software developer

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- Web/Mobile Application Developer
- Programmer
- Network Administrator

Course Objectives:

- To understand the basic Java Programming skills and object oriented programming concepts
- To know the working nature of Inheritances, Packages and Interfaces
- To examine the errors and to find the solution using Exception Handling and threads
- To apply the event handlers in the real time scenarios
- To develop applications using Graphical User Interfaces
- To aggregate the advanced Java skills of Swings
- To develop web applications using Java Applets

Course Outcomes (COs):

- CO1. Know the basic knowledge and programming skills of object oriented programming in Java
- CO2. Apply the Inheritance, package and interface concepts of Java to develop the elevated applications
- CO3. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
- CO4. Design event driven GUI and web related applications which mimic the real word scenarios.
- CO5. Able to develop interactive programs using applets and swings
- CO6. Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem.
- CO7. To design and develop the stand-alone applications as a team.

PO and PEO Mapping:

PEOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	✓	✓	✓	✓	✓	✓	—	—	✓	✓	✓	✓
PEO2	✓	✓	✓	✓	✓	✓	✓	—	✓	—	✓	—
PEO3	✓	✓	✓	—	—	✓	✓	✓	✓	✓	✓	✓

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Mapping of Course Outcomes with PO, PSO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H			M		M	M				M		M	M	H
CO2	M	M		H								L	H	M	M
CO3				H	H								H	M	
CO4				M		H	H	M		M	M				
CO5	M	M	M	M			H		L						M
CO6										H					
CO7									H		H				

H - High Correlation, M – Moderate Correlation, L - Low Correlation

Text Books:

Books	S.No	Name of the Book	Author/Publisher(s)/Year	Companion Websites
Text Books	1	The Complete Reference – Java	Herbert Schildt/Tata McGraw-Hill Education, Eleventh Edition/2019	https://www.oreilly.com/library/view/java-the-complete/9781260440249/
	2	Java SE8 for programmers	Paul J. Deitel, Harvey Deitel/Deitel Developer Series, 3rd, Edition/2014	http://ptgmedia.pearsoncmg.com/images/9780133891386/samplepages/0133891380.pdf
	3	Introduction to Java programming – comprehensive version	Y. Daniel Liang/ Tenth Edition, Pearson Ltd 2015.	http://www.pearson.com/us/higher-education/product/Liang-Intro-to-Java-Programming-Comprehensive-Version-10th-Edition/9780133761313.html
	4	Programming with JAVA A primer	E. Balagurusamy/Tata McGraw Hill Publication company, fourth edition/2010	https://books.google.co.in/books?id=a9q5AwAAQBAJ&printsec=frontcover&redir_esc=y#v=onepage&q&f=false
Reference Books	1	Java - How to Program	Paul Deitel Harvey Deitel/ Prentice Hall; 9th edition/ 2011.	https://books-library.net/files/download-pdf-ebooks.org-1489929113Bv7P9.pdf
	2	BIG JAVA, 4th Edition,	Cay Horstmann, John Wiley Sons/ 2009	https://books.google.co.in/books/about/Big_Java_4th_Edition.html?id=o2BOzQEACAAJ&redir_esc=y
	3	Professional Java for Web Applications,	Nicholas S. Williams, Wrox Press/2014	https://www.wiley.com/en-us/Professional+Java+for+Web+Applications-p-9781118656464
	4	An Introduction to Object Oriented Programming	T. Budd, Addison Wesley Longman/2009	https://web.engr.oregonstate.edu/~budd/Books/oopintro3e/info/ReadMe.html

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Web Resources:

S.No	Units	Websites
1	OOP Basics	https://www.javatpoint.com/java-oops-concepts https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/ https://www.w3schools.com/java/java_oop.asp
2	Inheritance, Packages and Interfaces	https://www.javatpoint.com/inheritance-in-java https://www.javatpoint.com/package https://www.javatpoint.com/interface-in-java
3	Exception Handling, I/O and Multithreading	https://www.mygreatlearning.com/blog/exception-handling-in-java/ https://www.tutorialspoint.com/java/java_files_io.htm https://www.w3schools.in/java/multithreading
4	Event Handling	https://www.tutorialspoint.com/awt/awt_event_handling.htm https://dducollegedu.ac.in/Datafiles/cms/ecourse%20content/BSC_2ndsem_java_lecture_11_Event_Handling.pdf https://dotnettutorials.net/lesson/event-handling-in-java/
5	GUI Programming with Swing	https://www.guru99.com/java-swing-gui.html https://www.edureka.co/blog/java-swing/ https://www.geeksforgeeks.org/introduction-to-java-swing/

Instruction Methodology:

Course Chart: #Weeks	Lecture (3 Hours)	Pedagogy	Practical (2 Hours)	Pedagogy
Week 1	JAVA BASICS: Review of Object oriented concepts, History of Java,	Explicit Teaching	Disseminate with Java Compiler and OOPS concepts	Study Experiment
	Java buzzwords, JVM architecture	Explicit Teaching		
	Data types- Variables, Scope and life time of variables	PPT		
Week 2	Arrays and operators	PPT	Hands on session for Basic Java	Demonstration
	Control statements	Explicit Teaching		

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	Type conversion and casting, simple java program	Explicit Teaching	Programming	
Week 3	Constructors- methods	PPT	Hands on session for Objects and Classes	Demonstration
	Static block, Static Data, Static Method	Explicit Teaching		
	String and String Buffer Classes, Using Java API Document.	Explicit Teaching		
Week 4	Basic concepts, Types of inheritance	PPT	Hands on session for Array and String	Demonstration
	Member access rules	Explicit Teaching		
	Usage of this and Super key word	Teaching		
Week 5	Method Overloading.- Method overriding, Abstract classes,	PPT	Hands on session for Static data, Static block and Static Method	Demonstration
	Dynamic method dispatch	Explicit Teaching		
	Usage of final keyword.	PPT		
Week 6	Defining package, Access protection	PPT	Hands on session for Inheritance	Demonstration
	Importing packages	PPT		
	Defining and Implementing interfaces, and Extending interfaces.	Explicit Teaching		
Week 7	Concepts of Exception Handling - Benefits of Exception Handling Exception types	Explicit Teaching	Hands on session for Interface	Demonstration
	Usage of Try, Catch, Throw, Throws and Finally keywords	Explicit Teaching		
	Built-in Exceptions	PPT		
Week 8	Creating own Exception classes	PPT	Hands on session for Exception Handling	Demonstration
	Input/Output: The I/O Classes and Interfaces	PPT		
	I/O Exceptions, Stream classes	Explicit		

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		Teaching		
Week 9	Concepts of Thread, Thread life cycle	PPT	<i>Mid-semester practical examination-I</i>	
	creating threads using Thread class and Runnable interface	PPT		
	Synchronization, Thread priorities, Inter Thread communication	Explicit Teaching		
Week 10	Events: Event Sources, Event Classes,	PPT	Hands on session for Stream Classes	Demonstration
	Event Listeners, Delegation Event Model,	PPT		
	Handling Mouse and Keyboard Events, Adapter Classes	Explicit Teaching		
Week 11	AWT: The AWT Class Hierarchy, User Interface Components- Labels, Button, Canvas	PPT	Hands on session for Multithreading	Demonstration
	Scrollbars, Text Components, Check Box, Check Box Groups	Explicit Teaching		
	Choices, Lists Panels – Scrollpane	Explicit Teaching		
Week 12	Dialogs, Menubar, Graphics, Layout Managers – Flow Layout,	PPT	Hands on session for Event Handling	Demonstration
	Border Layout, Grid Layout and Card Layout	PPT		
	Menu Bars and Menus.	Explicit Teaching		
Week 13	Swing: Introduction, Limitations of AWT	PPT	Hands on session for AWT	Demonstration
	MVC Connection	PPT		
	Components and Containers	PPT		
Week 14	Exploring Swing: JLabel and ImageIcon, JTextField, The Swing Buttons- JButton, JToggleButton	Explicit Teaching	Hands on session for Swings and	Demonstration

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	Check Boxes and Radio Buttons, JApplet, JScrollbar	PPT	Swing Menus	
	JList, JComboBox, Trees and JTable.	PPT		
Week 15	Introducing Swing Menus- Menu Basics	PPT	Mid-semester practical examination-II	
	Overview of JMenuBar, JMenu and JMenuItem	Explicit Teaching		
	Create a Main Menu.	Explicit Teaching		

Web links for similar courses offered at other Universities:

S.No	Course Title	Name of the University	Website
1	Java Programming	University of Helsinki Department of Computer Science University of Helsinki	https://studyuk.britishcouncil.org/options/universities?gclid=CNba26mR7tACFdCGaAodzkIC5g
2	Java Programming	Touro College USA	http://www.hotcoursesabroad.com/india/us-usa/school-college-university/tourocollege/115469/international.html
3	Java Programming	DIMA College Address: P.O. BOX 48379-00100, Nairobi Nairobi	https://www.kenyaplex.com/colleges/163-dynamic-institute-of-management-andaccountancy-dima-college.aspx
4	Web Programming	University of Washington Seattle, WA, United States	http://code.google.com/edu/submissions/uwspr2007_webprogramming/listing.html
5	Internet Programming with JAVA	Millersville University Millersville, PA 17551, United States	http://cs.millersville.edu/~webster/cs406j/ava/cs406.syllabus.html

Content Delivery Methodologies:

- Presentations (PPT)
- Demonstrations (Lab)

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Assessment Pattern:

S.No	Evaluation Method	Weightage (%)	Units Covered
Internal Continuous Assessment (50 marks)			
1	Sessional Examination-I	35 %	Unit I and Unit II
2	Sessional Examination-II		Unit III and Unit IV
3	Mid-Semester Practical	10 %	All Units
4	Regular Laboratory Performance	5 %	All Units
External Assessment (50 marks)			
1	Semester end theory examination	35 %	All Units
2	Semester end practical examination	15 %	All Units

Topics beyond the syllabus:

S.No	Topics	Web Link
1	Struts and Hibernate	https://www.javatpoint.com/hibernate-and-struts-integration https://www.tutorialspoint.com/struts_2/struts_hibernate.htm https://www.codejava.net/frameworks/struts/struts-2-spring-4-hibernate-4-integration-tutorial-part-1-xml-configuration https://www.dineshonjava.com/struts-2-hibernate-3-integration/
2	Java JDBC	https://www.javatpoint.com/java-jdbc https://www.geeksforgeeks.org/introduction-to-jdbc/ https://docs.oracle.com/javase/8/docs/technotes/guides/jdbc/

Assignment:

- <https://www.hackerearth.com/>
- <https://www.hackerrank.com/>
- <http://lms.karecse.in/login/login/index.php>

Assessment Methodologies:

Direct Assessment	Indirect Assessment
Sessional Examinations (two) Mid Semester Practical Regular Lab Performance Semester End Practical Semester End Theory	Course End Survey

Online Courses:

S.No	Course Name	Course Link
1	Programming in Java	https://onlinecourses.nptel.ac.in/noc23_cs49/preview
2	Java – Hindi	https://onlinecourses.swayam2.ac.in/aic20_sp46/preview
3	Java – Tamil	https://onlinecourses.swayam2.ac.in/aic20_sp51/preview

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Certification Courses:

- Microsoft certified Solution Developer (MCSO)
- Oracle Certified Java Programmer (OCJP)
- Oracle Certified Associate (OCA)
- Oracle Certified Professional (OCP)
- Oracle Certified Expert (OCE)
- Oracle Certified Master (OCM)

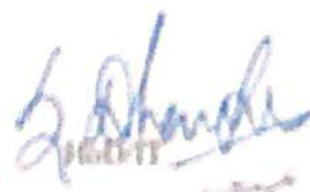
Magazines/Journals:

- IEEE Networks
- IEEE Internet computing
- IEEE Software


Course Coordinator


Module Coordinator


Program Coordinator


HOD-IT

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