



Srinivasa Ramanujan Institute of Technology (AUTONOMOUS)

Rotarypuram Village, B K Samudram Mandal, Ananthapuramu - 515 701

Title of the Course	Object Oriented Programming				
Course Code	R204GA05302				
Class, Semester, Section	II B. Tech - I Sem Section-A & B				
Course Type	Theory				
Regulation	SRIT- R20				
Course Structure	Theory			Practical	
	Lecture	Tutorials	Credits	Laboratory	Credits
	3	0	3	--	--
Course Coordinator	Dr. P. CHITRALINGAPPA				

1. Course Pre-requisites:

Level	Course Code	Semester	Prerequisites
B. Tech	R204GA05302	I	Action Script, Procedural Languages, Object-Oriented Languages

2. COURSE OVERVIEW: (Write the description of the course in 30 to 40 words)

This course deals with the concepts of Introduction, Data Types, Operators and Expressions, Classes and Methods, Inheritance, Exceptions, Packages, Interfaces, I/O, packages, collection Framework, AWT components, Event handling and swings.

3. MARKS DISTRIBUTION:

Subject	SEE	CIE	CAA	Total Marks
	60 marks	30 marks	10 marks	100 marks

4. CONTENT DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✓	Power Point Presentations	✓	Chalk & Talk	✓	Assignments	x	MOOC
x	Open Ended Experiments	x	Seminars	x	Mini Project	x	Videos
x	Course Project	x	Others				

5. EVALUATION METHODOLOGY:

The course will be evaluated for a total of 100 marks, with 40 marks for Continuous Internal Assessment (CIA) and 60 marks for Semester End Examination (SEE).

Semester End Examination (SEE): End examination of theory courses shall have the following pattern:

- There shall be 6 questions and all questions are compulsory.
- Question 1 shall contain 5 compulsory short answer questions for a total of 10 marks such that each question carries 2 marks. There shall be 1 short answer questions from each unit.
- In each of the questions from 2 to 6, there shall be either/or type questions of 10 marks each.
- Student shall answer any one of them.
- The questions from 2 to 6 shall be set by covering one unit of the syllabus for each question.

The expected percentage of cognitive level of the questions is broadly based on the criteria given in below Table.

Percentage of Cognitive Level	Blooms Taxonomy Level
0%	Remember
16.67%	Understand
83.33%	Apply
0 %	Analyze

Continuous Internal Assessment (CIA):

CIA is conducted for a total of 40 marks, with 30 marks for continuous internal examination (CIE) and 10 marks for Alternative Assessment Tool (AAT).

Component		Marks	Total Marks
CIA	CIE-1 for 30 marks & CIE-2 for 30 marks, Final CIE marks will be 80% of best + 20% of least	30	40
	CAA-1 for 10 marks & CAA-2 for 10 marks, Final CAA marks will be average of CAA-1 & CAA-2	10	
SEE	Semester End Examination (SEE)	60	60
Total Marks			100

Continuous Internal Examination (CIE):

For each theory course, during the semester, there shall be two CIEs. Each CIE will be evaluated for 30 marks. The first CIE will be conducted for around 50% of the syllabus and the second CIE will be conducted for the remaining syllabus. Final or consolidated CIE marks will be arrived by considering the marks secured by the student in both the CIEs with 80% weightage given to the better CIE and 20% to the other. The duration of CIE examination is 120 minutes.

- There shall be 4 questions and all are compulsory.
- Question 1 contains 3 short answer questions from each unit with equal weightage for a total of 6 marks. The student has to answer all of them.
- Questions 2-4 contains 3 either/ or type questions from each unit with equal weightage of 8 marks. The marks obtained by the student shall be out of 30 will be reduced to out of 20 marks. Any fraction shall be rounded off to next integer.
- If the student is absent for the CIE examination, no re-exam shall be conducted and marks for that examination shall be considered as zero.

Alternative Assessment Tool (AAT)

This CAA enables faculty to design own assessment patterns during the semester. The CAA enhances the autonomy (freedom and flexibility) of individual faculty and enables them to create innovative pedagogical practices. If properly applied, the CAA converts the classroom into an effective learning centre. The CAA may include assignments, seminars, term paper, open ended experiments, METE (Modeling and Experimental Tools in Engineering), five minutes video, MOOCs etc.

For each theory course, during the semester, there shall be two CAAs. Each CAA will be evaluated for 5 marks, the first CAA will be conducted before the first CIE and the second CAA will be conducted before second CIE. Final CAA marks will be arrived by adding the marks secured by the student in both the CAAs.

The final marks for CIA (for 40 marks) = Consolidated CIE marks (for 30 marks) + Consolidated CAA marks (for 10 marks)

6. COURSE OBJECTIVES:

From this course the students will try to learn:

I	Study the syntax, semantics and features of Java Programming Language.
II	Learn the method of creating multi-threaded programs and handle exceptions.
III	The model of object-oriented programming: abstract data types, encapsulation, inheritance and polymorphism
IV	Fundamental features of an object-oriented language like Java: object classes and interfaces, exceptions and libraries of object collections. Learn Java features to create GUI applications & perform event handling.

7. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO	Course Outcomes	Cognitive Level
CO1	Describe the Object-Oriented Principles in java.	Understand
CO2	Develop programs using type casting, type promotion and control statements for efficient problem solving.	Apply
CO3	Implement inheritance and exception handling for problem solving.	Apply
CO4	Implement threaded programming and usage of interfaces and packages.	Apply
CO5	Develop programs using collection framework and AWT frame work.	Apply
CO6	Develop programs using layout manager, Swing frame work and AWT controls suitable for the given problem scenario.	Apply

COURSE KNOWLEDGE COMPETENCY LEVEL:

S. No.	Cognitive Level	No. of COs mapped	%
1	Remember	0	0
2	Understand	1	16.67
3	Apply	5	83.33
4	Analyze	0	0
5	Evaluate	0	0

8. Program Outcomes and & Program Specific Outcomes:

Program Outcomes	
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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
PO4	Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	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
PO6	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.
PO7	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.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	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.
PO11	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.
PO12	Life-Long Learning: Recognize the need for and having the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

12. PERCENTAGE OF KEY COMPETENCIES FOR CO – PO/ PSO

COs	PROGRAM OUTCOMES												PSO'S		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
	No. of Vital Features														
	3	10	10	11	1	5	3	3	12	5	12	12	2	2	2
CO 1	66.66	-	-	-	-	-	-	-	-	-	-	-	50	-	-
CO 2	66.66	40	-	-	-	-	-	-	-	-	-	-	50	-	-
CO 3	66.66	30	-	-	-	-	-	-	-	-	-	-	50	-	-
CO 4	66.66	50	-	-	-	-	-	-	-	-	-	-	50	-	-
CO 5	66.66	60	-	-	-	-	-	-	-	-	-	-	50	-	-
CO 6	66.66	-	-	-	-	-	-	-	-	-	-	-	50	-	-

13. COURSE ARTICULATION MATRIX (PO / PSO MAPPING):

The Correlation levels of POs and PSOs are as follows.

Correlation **Level 3**: Percentage of vital features of PO/PSO $\geq 60\%$

Correlation **Level 2**: Percentage of vital features of PO/PSO $>40\%$ and $< 60\%$.

Correlation **Level 1**: Percentage of vital features of PO/PSO $>5\%$ and $\leq 40\%$.

COs	PROGRAM OUTCOMES												PSO'S		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
	No. of Vital Features														
	3	10	10	11	1	5	3	3	12	5	12	12	2	2	2
CO 1	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 2	3	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 4	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 5	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 6	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-

14. ASSESSMENT METHODOLOGY-DIRECT:

CIE Exams	✓	Laboratory Practices		Term Paper	
SEE Exams	✓	Student Viva		5 minutes video	
Seminars		Certification		Course Project	
Assignments	✓	Open ended experiments		Others	

15. ASSESSMENT METHODOLOGY-INDIRECT:

Assessment of mini projects by experts		Course Exit Survey	✓
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16. SYLLABUS:

UNIT – I:

(13 Periods)

Introduction to Java: Object Oriented Programming, History and Evolution of java, Java's magic: The byte code, Java Buzzwords, Java Keywords, The Java class Libraries.

Data Types, Operators and Control Statements: Java Data Types, Variables and Constants, Naming Conventions, Type conversion and casting, Arrays, Operators & Expressions, Java Control Statements.

Introducing Classes and Methods: Classes and Objects, Introducing Methods, Constructors, this Keyword, Garbage Collection. Overloading Methods and Constructors, Argument passing, Recursion, Introducing Access Control, understanding static, Command Line Arguments, Exploring the String class.

UNIT – II: (11 Periods)

Inheritance: Basics, super keyword, method overriding, dynamic method dispatch, Abstract classes, using final with inheritance, Introducing Nested and Inner classes.

Exception Handling: Fundamentals, Exception Types, Using try and catch, Multiple catch clauses, Nested try statements, throw, throws, finally, Java Built-in Exceptions, Creating user-defined exceptions.

UNIT – III: (14 Periods)

Packages and Interfaces: Basics of Packages, Access protection, Importing Packages, Creating and Importing User-defined Packages.

Interfaces: Declaring, Implementing and Extending Interfaces, using static methods in an Interface, using final keyword in interfaces.

Multithreaded Programming: Multithreading in Java, The Java Thread Model, Life Cycle of a Thread, the main thread, Creating Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Inter Thread Communication, Suspending, resuming and stopping threads, obtaining a thread state, The finalize () method.

UNIT – IV: (11 Periods)

Collections Framework: Overview, Collection Interfaces, Collection Classes. Working with Maps, Comparators.

Introduction to AWT: Windows, Graphics and Text

AWT classes, window fundamentals, frame windows, creating and displaying information within a window, Graphics, Color, Fonts, managing text output using Font Metrics.

UNIT – V: (14 Periods)

Event Handling in Java: The Delegation Event Model, Event Classes and Event Listener Interfaces.

AWT Controls, Layout Managers, and Menus: AWT Control Fundamentals, Labels, Buttons, Check Boxes, CheckboxGroup, Choice Controls, Lists, Scroll Bars, TextField and TextArea, Layout Managers, Menu Bars and Menus, Dialog Boxes, FileDialog.

Swings: Swing Features, MVC Connection, Components and Containers, JLabel, ImageIcon, JTextField, Swing Buttons, Check Boxes, Radio Buttons, JTabbedPane, JScrollPane, JList, JComboBox, JTree, and JTable.

Total Periods: 63**4. Text Books:**

1. **"The Complete Reference -Java"**, Herbert Schildt, Mc GRAW HILL Edition, 11th Edition, 2018.
2. **"Java – How to Program"**, Paul Deitel, Harvey Deitel, PHI, 11th Edition, 2017.

5. Reference Books:

1. **"A Programmers Guide to Java SCJP"**, Third Edition, Mughal, Rasmussen, Pearson, 2009.
2. **"Programming with Java"** T.V.Suresh Kumar, B.Eswara Reddy, P.Raghavan Pearson Edition, 2011.
3. **"Java Fundamentals - A Comprehensive Introduction"**, Herbert Schildt and Dale Skrien, Special Indian Edition, McGrawHill, 2013.

Google Classroom Link:

CSD-A: <https://classroom.google.com/u/1/c/NjE5MTQ1Njc4MzY0>

CSD-B: <https://classroom.google.com/u/1/c/NTIzNjMzMzM4ODg3>

17. Academic Calendar & Lesson Plan:**Academic Calendar:**

I Spell of instructions	28-08-20223 to 29-10-2023	9 Weeks
I CIE	30-10-2023 to 05-11-2023	1 Week
I Spell of instructions	06-11-2023 to 31-12-2023	8 Weeks
II CIE	01-01-2024 to 07-01-2024	1 Week
Remedial Classes Preparation Holidays	08-01-2024 to 15-01-2024	1 Week
Semester End Examinations – Theory	16-01-2024 to 25-01-2024	10 Days
Semester End Examinations – Practicals	26-01-2024-04-02-2024	10 Days
Commencement of class work for II B.Tech II Semester for the AY:2023-24	12-02-2024	

Lesson Plan:

S. No.	Topics to be covered	Mode of Delivery	Periods Required	Books followed	Scheduled Date
UNIT I Introduction to Java, Data types, Arrays and Variables, Operators, Control Statements, Introducing Classes					
1	Introduction to JAVA – Object Oriented Programming	ICT	1	T1, T2, R1	28-08-2023
2	History and Evolution of java,	ICT	1	T1, T2, R1	28-08-2023
3	Java's magic: The byte code, Java Buzzwords, OOP Concepts, Java Keywords,	ICT	1	T1, T2, R1	29-08-2023
4	The Java class Libraries	ICT	2	T1, T2, R1	30-08-2023
5	Java Data Types, Variables and Constants,	ICT	1	T1, T2, R1	31-08-2023
6	Naming Conventions,	ICT	1	T1, T2, R1	07-09-2023
7	Type conversion and casting, Arrays	ICT	1	T1, T2, R1	12-09-2023
8	Operators & Expressions, Java Control Statements, Classes and Objects	ICT	1	T1, T2, R1	12-09-2023
9	Introducing Methods, Constructors, this Keyword, Garbage Collection.	ICT	1	T1, T2, R1	13-09-2023
10	Overloading Methods and Constructors	ICT	1	T1, T2, R1	14-09-2023
11	Argument passing, Recursion, Introducing Access Control, understanding static, Command Line Arguments, Exploring the String class.	ICT	2	T1, T2, R1	19-09-2023
UNIT II Inheritance, Exception Handling					
1	Inheritance: Basics, super keyword, method overriding	ICT	2	T1, T2, R1	20-09-2023
2	dynamic method dispatch,	ICT	1	T1, T2, R1	21-09-2023
3	Abstract classes, using final with inheritance	ICT	1	T1, T2, R1	26-09-2023
4	Introducing Nested and Inner classes, Exception Handling: Fundamentals	ICT	2	T1, T2, R1	27-09-2023
5	Exception Types, Using try and catch	ICT	1	T1, T2, R1	28-10-2022
6	Multiple catch clauses	ICT	1	T1, T2, R1	2-10-2023
7	Nested try statements, throw, throws	ICT	1	T1, T2, R1	2-10-2023
8	finally, Java Built-in Exceptions	ICT	1	T1, T2, R1	3-10-2023
9	Creating user- defined exceptions	ICT	1	T1, T2, R1	4-10-2023
UNIT III Packages, Interfaces and Multithreading					
1	Packages: Basics, Access protection, Importing Packages	ICT	2	T1, T2, R1	11-10-2023
2	Creating and Importing User-defined Packages	ICT	1	T1, T2, R1	16-10-2023
3	Interfaces: Declaring, Implementing and Extending Interfaces, using static methods in an Interface	ICT	1	T1, T2, R1	16-10-2023
4	using final keyword in interfaces, Multithreaded Programming: Multithreading in Java	ICT	1	T1, T2, R1	17-10-2023
5	The Java Thread Model	ICT	1	T1, T2, R1	18-10-2023
6	Life Cycle of a Thread, the main thread, Creating Thread	ICT	1	T1, T2, R1	30-10-2023
7	Creating Multiple Threads	ICT	1	T1, T2, R1	30-10-2023
8	Thread Priorities, Synchronization, Inter Thread Communication, Suspending	ICT	2	T1, T2, R1	1-11-2023
9	resuming and stopping threads	ICT	1	T1, T2, R1	2-11-2023
10	Obtaining a thread state, the finalize ()	ICT	1	T1, T2, R1	7-11-2023

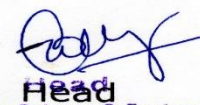
	method				
UNIT IV Collections Framework & Introduction to AWT					
1	Collections Framework: Overview & Introduction to AWT, Collection Interfaces	ICT	2	T1, T2, R1	8-11-2023
2	Collection Classes	ICT	2	T1, T2, R1	9-11-2023
3	Working with Maps, Comparators	ICT	1	T1, T2, R1	14-11-2023
4	Introduction to AWT: Graphics and Text AWT Classes, Windows fundamentals	ICT	1	T1, T2, R1	14-11-2023
5	frame windows	ICT	2	T1, T2, R1	15-11-2023
6	creating and displaying information within a window Graphics, Color, Fonts	ICT	2	T1, T2, R1	16-11-2023
7	Managing text output using Font Metrics	ICT	1	T1, T2, R1	21-11-2023
UNIT V Introduction to AWT, Event Handling, Swings					
1	Event Handling in Java: The Delegation Event Model	ICT	1	T1, T2, R1	22-11-2023
2	Event Classes and Event Listener Interfaces	ICT	1	T1, T2, R1	23-11-2023
3	AWT Controls, Layout Managers, and Menus: AWT Control Fundamentals, Labels, Buttons, Check Boxes	ICT	1	T1, T2, R1	28-11-2023
4	Checkbox Groups, Choice Controls, Lists, Scroll Bars	ICT	1	T1, T2, R1	28-11-2023
5	TextField and TextArea	ICT	1	T1, T2, R1	29-11-2023
6	Layout Managers, Menu Bars and Menus	ICT	1	T1, T2, R1	05-01-2024
7	Dialog Boxes, File Dialog	ICT	1	T1, T2, R1	06-01-2024
8	Swings: Swing Features, MVC Connection	ICT	1	T1, T2, R1	11-01-2024
9	Components and Containers	ICT	1	T1, T2, R1	12-01-2024
10	JLabel, ImageIcon, JTextField	ICT	1	T1, T2, R1	12-01-2024
11	Swing Buttons, Check Boxes, Radio Buttons, JTabbedPane	ICT	1	T1, T2, R1	18-01-2024
12	JScrollPane, JList	ICT	1	T1, T2, R1	18-01-2024
13	JComboBox	ICT	1	T1, T2, R1	19-01-2024
14	JTree, and JTable	ICT	1	T1, T2, R1	20-01-2024

18. Content beyond the Syllabus

S. No.	Topics covered beyond the syllabus	COs Mapped
1		
2		
3		
4		
5		



Course Coordinator



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