

Recognized Under 2(f) of UGC Act 1956 Approved by AICTE, New Delhi Affiliated to JNTUH, Hyderabad.

COURSE FILE

ON

JAVA PROGRAMMING LAB

Course Code - CS408PC

II B.Tech II-SEMESTER

A.Y.: 2022-2023

Prepared by

Mrs.B.S.Swapna Shanthi
Assistant Professor

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(V), Ibrahimnatnam/M), R.R.Dist.501 1C.

PRINCIPAL

Sri Indu Institute of Engineering & Tech Sheriguda(Vill), Ibrahimpatnam R.R. Dist. Telangana-501 510.



Recognized Under 2(f) of UGC Act 1956 Approved by AICTE, New Delhi Affiliated to JNTUH, Hyderabad.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Academic Year	2022-2023
Course Title	JAVA PROGRAMMING LAB
Course Code	CS408PC
Room No	A-206
Name of the lab incharge	Mr.K.JAYA PRAKASH
Name of the faculty incharge	Mrs.B.S.SWAPNA SHANTHI, Assistant
	Professor

Index of Course File

S. No.	Name of the content
1	Institute vision and mission
2	Department vision and mission /PEO
3	POs /PSOs
4	Course Syllabus with Structure
5	Course Outcomes (CO)
6	Mapping CO with PO/PSO.
7	List of experiments and their CO, PO mapping
8	Time table
9	Model Practical End examination questions
10	Schedule of end practical examinations
11	List of examiners
12	Lab occupancy chart
13	Dos and Don'ts
14	Physical lab floor plan with area in Sq.m
15	Lab manual
16	Lab Attainments



Recognized Under 2(f) of UGC Act 1956 Approved by AICTE, New Delhi Affiliated to JNTUH, Hyderabad.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INSTITUTE VISION AND MISSION

Vision:

To become a premier institute of academic excellence by providing the world class education that transforms individuals into high intellectuals, by evolving them as empathetic and responsible citizens through continuous improvement.

Mission:

IM1: To offer outcome-based education and enhancement of technical and practical skills.

IM2: To continuous assess of teaching-learning process through institute-industry collaboration..

IM3: To be a centre of excellence for innovative and emerging fields in technology development with state-of-art facilities to faculty and students fraternity.

IM4: To create an enterprising environment to ensure culture, ethics and social responsibility among the stakeholders

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(M), Ibrahimnatnam/M), R.R.Dist-501 10.

PRINCIPAL
Sri Indu Institute of Engineering & Tech
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.



Recognized Under 2(f) of UGC Act 1956 Approved by AICTE, New Delhi Affiliated to JNTUH, Hyderabad.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DEPARTMENT VISION AND MISSION

Vision:

To become a prominent knowledge hub for learners, strive for educational excellence with innovative and industrial techniques so as to meet the global needs.

Mission:

DM1: To provide ambience that enhances innovations, problem solving skills, leadership qualities, decision making, team-spirit and ethical responsibilities.

DM2: To impart quality education with professional and personal ethics, so as to meet the challenging technological needs of the industry and society.

DM3: To provide academic infrastructure and develop linkage with the world class organizations to strengthen industry-academia relationships for learners.

DM4: To provide and strengthen new concepts of research in the thrust area of Computer Science and Engineering to reach the needs of Government and Society.

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(V), Ibrahimnatnam/M), R.R.Disi-551 1C.

Sri Indu Institute of Engineering & Tech Sheriguda(Vill), Ibrahimpatnam R.R. Dist. Telangana-501 510.



Recognized Under 2(f) of UGC Act 1956 Approved by AICTE, New Delhi Affiliated to JNTUH, Hyderabad.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

- **PEO1:** To develop trained graduates with strong academic and technical skills of modern computer science and engineering.
- **PEO2:** To promote trained graduates with leadership qualities and the ability to solve real time problems using current techniques and tools in interdisciplinary environment.
- **PEO3:** To motivate the graduates towards lifelong learning through continuing education and professional development.

PROGRAM SPECIFIC OUTCOMES

- **PSO1:** Professional Skills: To implement computer programs of varying complexity in the areas related to Web Design, Cloud Computing, Network Security and Artificial Intelligence.
- **PSO2:** Problem-Solving Skills: To develop quality products using open ended programming environment.

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(V), Ibrahimnatnam/M), R.R.Dist-501 10.

Sri Indu Institute of Engineering & Tech Sheriguda(Vill), Ibrahimpatnam R.R. Dist. Telangana-501 510.



Recognized Under 2(f) of UGC Act 1956 Approved by AICTE, New Delhi Affiliated to JNTUH, Hyderabad.

PROGRAMME OUTCOMES (POs)

- **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 have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B.Tech. in COMPUTER SCIENCE AND ENGINEERING COURSE STRUCTURE & SYLLABUS (R18)

Applicable From 2018-19 Admitted Batch

II YEAR I SEMESTER

S. No.	Course	Course Title	L	Т	P	Credits
201100	Code	0001200 22000	_			010000
1	CS301ES	Analog and Digital Electronics	3	0	0	3
2	CS302PC	Data Structures	3	1	0	4
3	MA303BS	Computer Oriented Statistical Methods	3	1	0	4
4	CS304PC	Computer Organization and Architecture	3	0	0	3
5	CS305PC	Object Oriented Programming using C++	2	0	0	2
6	CS306ES	Analog and Digital Electronics Lab	0	0	2	1
7	CS307PC	Data Structures Lab	0	0	3	1.5
8	CS308PC	IT Workshop Lab	0	0	3	1.5
9	CS309PC	C++ Programming Lab		0	2	1
10	*MC309	Gender Sensitization Lab		0	2	0
		Total Credits	15	1	12	21

S. No.	Course	Course Title	L	Т	P	Credit
	Code					s
1	CS401PC	Discrete Mathematics	3	0	0	3
2	SM402M	Business Economics & Financial Analysis	3	0	0	3
	S					
3	CS403PC	Operating Systems	3	0	0	3
4	CS404PC	Database Management Systems	3	1	0	4
5	CS405PC	Java Programming	3	1	0	4
6	CS406PC	Operating Systems Lab	0	0	3	1.5
7	CS407PC	Database Management Systems Lab	0	0	3	1.5
8	CS408PC	Java Programming Lab	0	0	2	1
9	*MC409	Constitution of India	3	0	0	0
		Total Credits	18	2	8	21

^{*}MC – Satisfactory/Unsatisfactory



Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

R18 B.Tech. CSE Syllabus

JNTU HYDERABAD

CS408PC: JAVA PROGRAMMING LAB

B.TECH II Year II Sem.

LTPC 0021

Course Objectives:

- To write programs using abstract classes.
- To write programs for solving real world problems using java collection frame work.
- To write multithreaded programs.
- To write GUI programs using swing controls in Java.
- To introduce java compiler and eclipse platform.
- To impart hands on experience with java programming.

Course Outcomes:

- Able to write programs for solving real world problems using java collection frame work.
- Able to write programs using abstract classes.
- Able to write multithreaded programs.
- Able to write GUI programs using swing controls in Java.

Note:

- 1. Use LINUX and MySQL for the Lab Experiments. Though not mandatory, encourage the use of Eclipse platform.
- 2. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed.

List of Experiments:

1. Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.

- 2. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.
- 3. a) Develop an applet in Java that displays a simple message.
- b) Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.
- 4. Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num 2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a message dialog box.
- 5. Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
- 6. Write a Java program for the following:

Create a doubly linked list of elements.

Delete a given element from the above list.

Display the contents of the list after deletion.

- 7. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "Stop" or "Ready" or "Go" should appear above the buttons in selected color. Initially, there is no message shown.
- 8. Write a Java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.
- 9. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.
- 10. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).
- 11. Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint:use hash tables).
- 12. Write a Java program that correctly implements the producer consumer problem using the concept of interthread communication.
- 13. Write a Java program to list all the files in a directory including the files present in all its

subdirectories.

- 14. Write a Java program that implements Quick sort algorithm for sorting a list of names in ascending order
- 15. Write a Java program that implements Bubble sort algorithm for sorting in descending order and also shows the number of interchanges occurred for the given set of integers.

REFERENCE BOOKS

- 1. Java for Programmers, P. J. Deitel and H. M. Deitel, 10th Edition *Pearson* education.
- 2. Thinking in Java, Bruce Eckel, *Pearson* Education.
- 3. Java Programming, D. S. Malik and P. S. Nair, Cengage Learning.
- 4. Core Java, Volume 1, 9th edition, Cay S. Horstmann and G Cornell, *Pearson*.

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

JAVA PROGRAMMING LAB

CO's, PO's, PSO's MAPPING

AY:2022-2023 SEMESTER-II Class: II CSE-A

Course Outcomes:

After completing this course, the student will be able to:

- C228.1: Construct the programs for Abstract classes, Inheritance and Interface. (Synthesis)
- C228.2: Write the program for Multithreading and Files operations. (Knowledge).
- C228.3: Prepare the programs for applets (Application).
- C228.4: Develop the basic applications by using Swing components (Synthesis).
- C228.5: Construct the programs for collection Framework (Analysis).
- C228.6: Recognize the concept of Event Listeners and implements the Event components (Knowledge).

Mapping of course outcomes with program outcomes and program specific outcomes:

High -3 Medium -2 Low-1

PO/PSO/ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C228.1	3	-	3	-	2	-	-	-	-	-	-	-	2	2
C228.2	-	2	3	-	2	2	-	-	-	-		-	2	
C228.3	3	2	-	-	3	-	-	-	-	1	ı	1		-
C228.4	-	-	3	2	-	-	-	-	-	-	ı	2	3	-
C228.5	-	3	2	-	-	-	-	-	-	-	1	2	ı	3
C228.6	3	-	2	3	-	-	-	-	-	-	ı	-	ı	-
C228	3	2.3	2.6	2.5	2.3	2	-	-	-	-	-	2	2.3	2.5

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

JAVA PROGRAMMING LAB

LIST OF EXPERIMENTS AND THEIR CO, PO MAPPING

SNO	Name of the program	СО	PO/I	PSO
5110	Name of the program		РО	PSO
1	 Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result. Handle any possible exceptions like divided by zero. 	C228.4 & C228.3	PO1,PO2, PO3,PO4 PO12	PSO1
2	 3. A) Develop an applet in Java that displays a simple message. B) Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files. 4. Write a Java program that creates a 	C228.2, C228.3, C228.4	PO1, PO2, PO3, PO4, PO5, PO6, PO12	PSO1

	user interface to perform integer			
	divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num 2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a			
	message dialog box. 5. Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.			
	6. Write a Java program for the following:			
3	i) Create a doubly linked list of elements.ii) Delete a given element from the above list.iii) Display the contents of the list after deletion	C228.5	PO2, PO3, PO12	PSO2
4	7. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "Stop" or "Ready" or "Go" should appear above the buttons in selected color. Initially, there is no message shown.	C228.4	PO3, PO5	PSO1
	8. Write a Java program to create an abstract class named Shape that			
5	contains two integers and an empty method named print Area (). Provide three classes named Rectangle,	C228.1,	PO1,PO3,	PSO1
	Triangle, and Circle such that each one of the classes extends the class Shape.	C228.4	PO4,PO5,	PSO2

	Each one of the classes contains only the method print Area () that prints the area of the given shape.		PO12	
6	9. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.	C228.5, C228.6	PO1, PO2, PO3,PO4 PO12	PSO2
7	10. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes). 11. Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).	C228.5, C228.6	PO1, PO2, PO3,PO4 PO12	PSO2
8	 12. Write a Java program that correctly implements the producer –consumer problem using the concept of inter thread communication. 13. Write a Java program to list all the files in a directory including the files present in all its subdirectories. 	C228.2	PO2, PO3,PO5	PSO1, PSO2
9	 14. Write a java program that implements Quick sort algorithm for sorting a list of names in ascending order. 15. Write a Java Program that implements bubble sort algorithm for sorting in descending order and also shows the number of interchanges occurred for the given set of integers. 	C228.5	PO2,PO3 PO12	PSO2



(An Autonomous Institution under UGC)

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510
Website: https://siiet.ac.in/

TIME TABLE FOR A.Y 2022-23

Class: II-B. Tech CSE -A

Semester: II

LH. NO: A-301

W.E.F:1-05-2023

Period/	1	2	3	4	1:00-	5	6	7	
Day	9:40-10:30	10:30-11:20	11:20-12:10	12:10-1:00	1:30	1:30-2:20 2:20-3:10 3:10-4			
Monday	DM	JAVALAB(BA	ATCH-I) / DBMS LAI	B(BATCH-II)		COI	JAVA	DBMS	
Tuesday	OS	DBMS/JAVA(T)	LIB	DBMS		COI	CO-C/	CO-C/SS/DAA	
Wednesday	JAVA	OS	DBMS	BEFA	LUN	DBMS LAB	(BATCH-I) /OS LAI	B (BATCH-II)	
Thursday	DM	COUN	BEFA	DM	СН	OS	DBMS	BEFA	
Friday	COI	INT	OS	JAVA/DBMS(T)		JAVA	BEFA	SPORTS	
Saturday	DBMS	DM	JAVA	OS		OS LAB (BATCH-I) / JAVALAB(BATCH-II)			

SubjectCode	Subject Name	Name of the Faculty	Subject Code	Subject Name	Name of the Faculty
CS401PC	Discrete Mathematics	Dr.E.Naga Ratnam	CS405PC	Java Programming	Mrs B.S .Swapna Shanti
SM402MS	Business Economics & Financial Analysis	Mr.U P Bharadwaja	CS406PC	Operating Systems Lab	Mrs T.Ramya Priya/ Mrs P.Sowjanya/ Mr.Veera kishore K
CS403PC	Operating Systems	Mrs T.Ramya Priya	CS407PC Lab	Database Management Systems	Mrs D. Rajeswari/ V. Divya/ Mr A Vijay Kumar
CS404PC	Database Management Systems	Mrs D. Rajeswari	CS408PC	Java Programming Lab	Mrs B.S .Swapna Shanti/ Mrs.R.Padma/ Mrs R Ganga
	CO-C/SS/DAA	Mrs B.S .Swapna Shanti	MC409	Constitution of India	Mrs K Laxmi Shilpa
Sports	Sports	Mr.P Sreeramulu	LIB	Library	Mrs T.Ramya Priya
Internet	Internet	Mr D Nagaraju	COUN	Counselling	Mrs T.Ramya Priya
Class In-Ch	arge: Mrs D. Rajeswari	Mentor 1: Mrs D. I	Rajeswari	Mentor 2: Mrs B.S.	

Class In-Change

Computer Stophice & Enga Dept.

PRINCIPAL
Sri Indu Institute of Engineering & Tech
Sheriguda(Vill) PRINCIPALIAN
Sheriguda(Vill)



Accredited by NAAC with A+ Grade

Recognized under 2(f) of UGC Act 1956. (Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad) Sheriguda(V), Ibrahimpatnam(M), R.R Dist., Telangana - 501 510

Lab External Question paper

Year & Semester: II-II Sem Branch: CSE

Subject Name: Java Programming Lab

Faculty Name: B.S.Swapna Shanthi

1 A) Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.

b)Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.

- 2 a) Develop an applet in Java that displays a simple message.
- b) Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.
- b) Write a java program to demonstrate EXCEPTION HANDLING
- 3 a) Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division ofNum1 and Num 2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a message dialog box
- b)Write a java program to demonstrate FINAL keyword
- 4 a) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number
- b)Write a java program to demonstrate SUPER keyword
- 5 a) Write a Java program for the following: Create a doubly linked list of elements. Delete a given element from the above list. Display the contents of the list after deletion.
- b) Write a java program to demonstrate CONSTRUCTORS
- 6 a)Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "Stop" or "Ready" or "Go" should appear above the buttons in selected color. Initially, there is no message shown.

b)Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.

7 a)Write a Java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.

- b) Write a java program to demonstrate EXCEPTION HANDLING
- 8 a)Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.
- b)Write a java program to demonstrate FINAL keyword
- 9 a)Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).
- b)Write a java program to demonstrate SUPER keyword
- 10 a)Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).
- b)Write a java program to demonstrate CONSTRUCTORS
- 11 a)Write a Java program that correctly implements the producer consumer problem using the concept of inter thread communication
- b)Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.
- 12 a)Write a Java program to list all the files in a directory including the files present in all its subdirectories b)Write a java program to demonstrate EXCEPTION HANDLING
- 13 a)Write a Java program that implements Quick sort algorithm for sorting a list of names in ascending order
- b)Write a java program to demonstrate FINAL keyword
- 14 a) Write a Java program that implements Bubble sort algorithm for sorting in descending order and also shows the number of interchanges occurred for the given set of integers.
- b) Write a java program to demonstrate SUPER keyword

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

Java Programming Lab External Timetable. Examination Branch

A.Y.: 2022-23 SEM-II

Date	Day	Branch	Session	H T.No	Total No. of Students
16/9/2023	SATURDAY	CSE-A	FN	21X31A0501 TO 21X31A0565 & 22X35A0501 TO 22X35A0508	69
15/9/2023	FRIDAY	CSE-B	AN	21X31A0566 TO 21X31A05D0 & 22X35A0509 TO 22X35A0516	69
16/9/2023	SATURDAY	CSE-C	AN	21X31A05D1 TO 21X31A05J4 & 22X35A0517 TO 22X35A0522	68

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(M), Ibrahimnatnam/M), R.R.Dist-501 10.

Sri Indu Institute of Engineering & Tech Sheriguda(Vill), Ibrahimpatnam R.R. Dist. Telangana-501 510.



Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956. (Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad) Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

Java Programming Lab External TimeTable With Examiner

A.Y.: 2022-23 **SEM-II**

SRI INDU INSTITUTE OF ENGINEERING & TECHNOLOGY

LAB EXTERNAL EXAMINATIONS TIME-TABLE, SEP-2023 II-II SEM DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING(IOT,CS,AIML,AI&DS)

TIMINGS FN: 10:00 AM TO 1:0 PM AN: 1:00PM TO 4:00PM

Date: 14/09/2023

S.NO	YEAR/SEC	NAME OF THE LAB	DATE	SESSION	LOCATION	NAME OF THE INTERNAL EXAMINER	NAME OF THE EXTERNAL EXAMINER
		DBMS LAB	19/9/2023	FN	LAB NO-A-6&4	Mrs.D.Rajeshwar	Mr.G.Harish Reddy (9963992727)
2	II-II-CSE-A	JAVA LAB	16/9/2023	FN ·	LAB NO-A-7&8	Mrs.B.S.Swapna shanthi	Dr.B.Srinu (8185924275)
3		OPERATING SYSTEMS LAB	15/9/2023	FN	LAB NO-A- 1&2	Mrs.P.Ramya priya	Mrs.R.Akshara (9177841919)
4		DBMS LAB	16/9/2023	FN	LAB NO-A-6&4	Mrs.D.Uma	Mr.N.SriAnjaneya (9866858140)
5	II-II-CSE-B	JAVA LAB	15/9/2023	AN	, LAB NO-A-7&8	Mrs.M.Karuna	Mr.CH.CHAITANYAKU MAR(8500330546)
6	-	OPERATING SYSTEMS LAB	19/9/2023	FN	LAB NO-A- 1&2	Mr.D.Nagaraju	Mrs.Durga Devi (9948353838)
7		DBMS LAB	15/9/2023	FN	LAB NO-A-6&4	Mrs.P.H.Swarna Rekha	Mr.S.Kranthi Reddy (9573013861)
8	II-I-CSE-C	JAVA LAB	16/9/2023	AN	LAB NO-A-7&8	Mrs.J.Priyanka	Mrs.K.L.Anusha (9704446862)
9		OPERATING SYSTEMS LAB	19/9/2023	AN	LAB NO-A- 1&2	Mr.P.Sreeramulu	Mr.Chaithanya Kumar (9989698416)

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(V), iorahimnatnam/M), R.R.Dist-501 10

TO TO TO THE PROPERTY OF THE P

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

LAB OCCUPANCY CHART

JAVA PROGRAMMING LAB

ROOM NO:A-206 BLOCK:A FLOOR:2

	I 9:40-10:30	II 10:30-11:20	III 11:20-12:10	IV 12:10-1:00	LUNCH	V 1:30-2:20	VI 2:20-3:10	VII 3:10-4:00
MON		II BT	ECH II SEM (CSE-A				
TUE					-	II BT	ECH II SEM	CSE-B
WED					-			
THU					=			
FRI		II BT	ECH II SEM (CSE-B	-			
SAT					1	II BT	ECH II SEM	CSE-B

Computer Science & Engg. Dept. SRI INDU INSTITUTE OF ENGG & TECH. Sheriguda(V), Ibrahimmatnam/M), R.R.Dist-501 10.

PRINCIPAL

Sri Indu Institute of Engineering & Tech Sheriguda(Vill), Ibrahimpatnam R.R. Dist. Telangana-501 510.



Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510
Website: https://siiet.ac.in/

JAVA PROGRAMMING LAB

Do's and Don'ts

Do's

- 1. Come with completed observation and record.
- 2. Remove your shoes or wear foot socks before you enter the lab.
- 3. Always keep quiet. Be considerate to other lab users.
- 4. Report any problems with the computer to the person in charge.
- 5. Shut down the computer properly.
- 6. Wear ID card before entering into the lab.
- 7. Read and understand how to carry out an activity thoroughly before coming to the lab.
- 8. Write In time, Out time and system details in the login register

Don'ts

- 1. Do not touch any part of the computer with wet hands.
- 2. Do not change system settings.
- 3. Do not hit the keys on the computer too hard.
- 4. Don't damage, remove, or disconnect any labels, parts, cables or equipment.
- 5. Do not install or download any software or modify or delete any system files on any lab computers
- 6. Do not disturb your neighbouring students. They may be busy in completing tasks.
- 7. Do not remove anything from the computer laboratory without permission.
- 8. Do not use pen drives.

TOTAL ENGINEERING TOTAL STREET

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510
Website: https://siiet.ac.in/

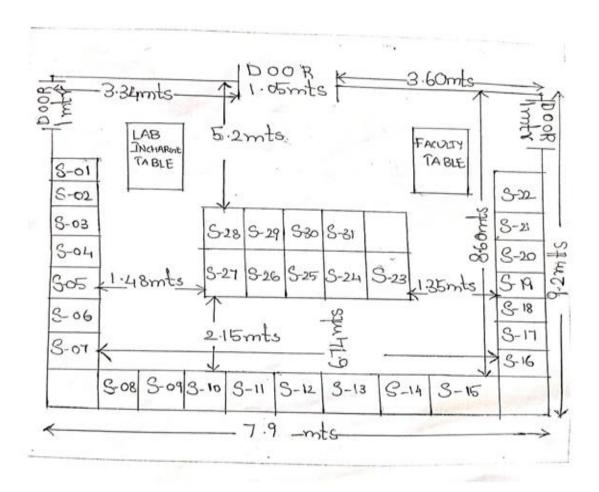
JAVA PROGRAMMING LAB

PHYSICAL LAB-8 FLOOR PLAN

ROOM NO:A-206

BLOCK:A

FLOOR:2



Lab Area (In. Sqm.)=7.9 x 9 + 72.68 Sqm. Lab Area (In. Sft.)=96.0 x 20.19 = 782.395 ft.

LAB In Charge

Head of the Department

B. Rama kou



Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510
Website: https://siiet.ac.in/

Lab manual link

https://drive.google.com/file/d/1863Ddi0QWvkuQcJUiY3aE8MS5rgBRoWc/view?usp=sharing



Department of Computer Science and Engineering

Course Outcome Attainment (Internal Examination-1)

Name of the faculty: B S SWAPNA SHANTHI Academic Year: 2022-2023

Branch & Section: CSE-A Year / Semester: II/II

Course Name: JAVA PROGRAMMING LAB Internal II

S.No	HT No.	PW + E	V	DDE
Max. Ma	arks ==>	5	5	15
1	21X31A0501	5	5	11
2	21X31A0502	5	5	12
3	21X31A0503	5	5	10
4	21X31A0504	5	5	11
5	21X31A0505	5	5	10
6	21X31A0506	5	5	15
7	21X31A0507	5	5	10
8	21X31A0508	5	5	9
9	21X31A0509	5	5	12
10	21X31A0510	5	5	4
11	21X31A0511	5	5	13
12	21X31A0512	5	5	4
13	21X31A0513	5	5	10
14	21X31A0514	5	5	13
15	21X31A0515	5	5	11
16	21X31A0516	5	5	4
17	21X31A0517	5	5	12
18	21X31A0518	5	5	11
19	21X31A0519	5	5	13
20	21X31A0520	5	5	10
21	21X31A0521	5	5	10
22	21X31A0522	5	5	11
23	21X31A0523	5	5	13
24	21X31A0524	5	5	10
25	21X31A0525	5	5	14
26	21X31A0526	5	5	13
27	21X31A0527	5	5	11
28	21X31A0528	5	5	10
29	21X31A0529	5	5	12
30	21X31A0530	5	5	10

31	21X31A0531	5	5	4
32	21X31A0532	5	5	6
33	21X31A0533	5	5	15
34	21X31A0534	5	5	15
35	21X31A0535	5	5	4
36	21X31A0536	5	5	9
37	21X31A0537	5	5	13
38	21X31A0538	5	5	11
39	21X31A0539	5	5	4
40	21X31A0540	5	5	13
41	21X31A0541	5	5	11
42	21X31A0542	5	5	12
43	21X31A0543	5	5	10
44	21X31A0544	5	5	4
45	21X31A0545	5	5	15
46	21X31A0546	5	5	6
47	21X31A0547	5	5	6
48	21X31A0548	5	5	13
49	21X31A0549	5	5	10
50	21X31A0550	5	5	12
51	21X31A0552	5	5	10
52	21X31A0554	5	5	15
53	21X31A0555	5	5	10
54	21X31A0556	5	5	10
55	21X31A0557	5	5	13
56	21X31A0559	5	5	14
57	21X31A0560	10	10	15
58	21X31A0561	5	5	13
59	21X31A0562	5	5	12
60	21X31A0563	5	5	6
61	21X31A0564	5	5	6
62	21X31A0565	5	5	10
63	22X35A0501	5	5	13
64	22X35A0502	5	5	10
65	22X35A0503	5	5	10
66	22X35A0505	5	5	11
67	22X35A0506	5	5	12
68	22X35A0507	5	5	12
69	22X35A0508	5	5	13
	et by the faculty / HoD	3.00	3.00	9.00
Number of students performed above the target		69	69	57
Number of students attempted		69	69	69
Percentage of students scored more than target		100%	100%	83%

CO Mapping with Exam Questions:

CO - 1	y	y	Y
CO - 2	y	y	Y
CO - 3	y	y	Y
CO - 4	y	y	Y
CO - 5	y	y	Y
CO - 6	y	y	Y

CO Attainment based on Exam Questions:

CO - 1	100%	100%	83%
CO - 2	100%	100%	83%
CO - 3	100%	100%	83%
CO - 4	100%	100%	83%
CO - 5	100%	100%	83%
CO - 6	100%	100%	83%

СО	Intrnal practical	DDE	OveralI	Level
CO-1	100%	83%	91%	3
CO-2	100%	83%	91%	3
CO-3	100%	83%	91%	3
CO-4	100%	83%	91%	3
CO-5	100%	83%	91%	3
CO-6	100%	83%	91%	3

Attainment Level			
1	60%		
2	70%		
3	>80%		

Attainment (Internal 1 Examination) =

3



Department of Computer Science and Engineering

Course Outcome Attainment (Internal Examination-2)

Name of the faculty: B.S.SWAPNA SHANTHI Academic Year: 2022-2023

Branch & Section: CSE-A Year / Semester: II/II

Course Name: JAVA PROGRAMMING LAB Internal II

S.No	HT No.	PW + E	V	DDE
Max. Ma	arks ==>	5	5	15
1	21X31A0501	5	5	11
2	21X31A0502	5	5	12
3	21X31A0503	5	5	10
4	21X31A0504	5	5	11
5	21X31A0505	5	5	10
6	21X31A0506	5	5	15
7	21X31A0507	5	5	10
8	21X31A0508	5	5	9
9	21X31A0509	5	5	12
10	21X31A0510	5	5	4
11	21X31A0511	5	5	13
12	21X31A0512	5	5	4
13	21X31A0513	5	5	10
14	21X31A0514	5	5	13
15	21X31A0515	5	5	11
16	21X31A0516	5	5	4
17	21X31A0517	5	5	12
18	21X31A0518	5	5	11
19	21X31A0519	5	5	13
20	21X31A0520	5	5	10
21	21X31A0521	5	5	10
22	21X31A0522	5	5	11
23	21X31A0523	5	5	13
24	21X31A0524	5	5	10
25	21X31A0525	5	5	14
26	21X31A0526	5	5	13
27	21X31A0527	5	5	11
28	21X31A0528	5	5	10
29	21X31A0529	5	5	12
30	21X31A0530	5	5	10

21X31A0531 21X31A0532 21X31A0533	5	5	4
	5	5	
21/21/05/2			6
	5	5	15
21X31A0534	5	5	15
			4
			9
21X31A0537			13
21X31A0538			11
21X31A0539			4
21X31A0540	5		13
21X31A0541	5		11
21X31A0542	5	5	12
21X31A0543	5	5	10
21X31A0544	5	5	4
21X31A0545	5	5	15
21X31A0546	5	5	6
21X31A0547	5	5	6
21X31A0548	5	5	13
21X31A0549	5	5	10
21X31A0550		5	12
21X31A0552			10
21X31A0554			15
			10
			10
			13
			14
			15
			13
			12
			6
			6
			10
			13
			10
			10
			11
			12
			12
ZZASSAUSUŏ	3	3	13
t by the faculty / HoD	3.00	3.00	9.00
of students performed target	69	69	57
of students attempted	69	69	69
e of students scored	100%	100%	83%
	21X31A0535 21X31A0536 21X31A0537 21X31A0538 21X31A0539 21X31A0540 21X31A0541 21X31A0541 21X31A0543 21X31A0544 21X31A0545 21X31A0546 21X31A0547 21X31A0548 21X31A0549 21X31A0550 21X31A0550 21X31A0550 21X31A0556 21X31A0556 21X31A0556 21X31A0556 21X31A0561 21X31A0561 21X31A0561 21X31A0563 21X31A0563 21X31A0563 21X31A0563 21X31A0563 21X31A0563 21X31A0565 22X35A0501 22X35A0501 22X35A0505 22X35A0506 22X35A0507 22X35A0508	21X31A0535 5 21X31A0536 5 21X31A0537 5 21X31A0538 5 21X31A0539 5 21X31A0540 5 21X31A0541 5 21X31A0542 5 21X31A0543 5 21X31A0544 5 21X31A0545 5 21X31A0546 5 21X31A0546 5 21X31A0547 5 21X31A0548 5 21X31A0549 5 21X31A0550 5 21X31A0560 10 21X31A0561 5 21X31A0561 5 21X31A0561 5 21X31A0563 5 21X31A0564 5 21X31A0565 5 22X35A0501 5 22X35A0501 5 22X35A0505 5 22X35A0505 5 22X35A0506 5 22X35A0507 5 22X35A0508 5 **Georgia and the preformed target** **Georgia and t	21X31A0535 5 5 21X31A0536 5 5 21X31A0537 5 5 21X31A0538 5 5 21X31A0539 5 5 21X31A0540 5 5 21X31A0541 5 5 21X31A0542 5 5 21X31A0543 5 5 21X31A0544 5 5 21X31A0545 5 5 21X31A0545 5 5 21X31A0546 5 5 21X31A0547 5 5 21X31A0548 5 5 21X31A0549 5 5 21X31A0550 5 5 21X31A0550 5 5 21X31A0550 5 5 21X31A0555 5 5 21X31A0556 5 5 21X31A0559 5 5 21X31A0561 5 5 21X31A0563 5 5

CO Mapping with Exam Questions:

CO - 1	y	y	Y
CO - 2	y	y	Y
CO - 3	y	y	Y
CO - 4	y	y	Y
CO - 5	y	y	Y
CO - 6	y	y	Y

CO Attainment based on Exam Questions:

CO - 1	100%	100%	83%
CO - 2	100%	100%	83%
CO - 3	100%	100%	83%
CO - 4	100%	100%	83%
CO - 5	100%	100%	83%
CO - 6	100%	100%	83%

СО	Intrnal practical	DDE	OveralI	Level
CO-1	100%	83%	91%	3
CO-2	100%	83%	91%	3
CO-3	100%	83%	91%	3
CO-4	100%	83%	91%	3
CO-5	100%	83%	91%	3
CO-6	100%	83%	91%	3

Attainment Level									
1 60%									
2	70%								
3	>80%								

Attainment (Internal 2 Examination) =

3



Department of Computer Science and Engineering

Course Outcome Attainment (University Examinations)

Name of the faculty: B S SWAPNA SHANTHI Academic Year: 2022-2023

Branch & Section: CSE-A Year / Semester: II/II

Course Name: JAVA PROGRAMMING LAB

S.No	Roll Number	Marks Secured						
1	21X31A0501	62						
2	21X31A0501 21X31A0502	65						
3	21X31A0502 21X31A0503	60						
4	21X31A0503	73						
5	21X31A0504 21X31A0505	67						
6	21X31A0505	75						
7	21X31A0507	60						
8	21X31A0508	61						
9	21X31A0509	63						
10	21X31A0510	35						
11	21X31A0511	70						
12	21X31A0512	35						
13	21X31A0513	60						
14	21X31A0514	73						
15	21X31A0515	69						
16	21X31A0516	32						
17	21X31A0517	66						
18	21X31A0518	64						
19	21X31A0519	72						
20	21X31A0520	63						
21	21X31A0521	61						
22	21X31A0522	69						
23	21X31A0523	73						
24	21X31A0524	60						
25	21X31A0525	75						
26	21X31A0526	70						
27	21X31A0527	68						
28	21X31A0528	60						
29	21X31A0529	68						
30	21X31A0530	63						
31	21X31A0531	31						
32	21X31A0532	33						
33	21X31A0533	74						
34	21X31A0534	74						
35	21X31A0535	AB						
36	21X31A0536	58						
37	21X31A0537	67						

S.No	Roll Number	Marks Secured
38	21X31A0538	68
39	21X31A0539	34
40	21X31A0540	63
41	21X31A0541	66
42	21X31A0542	67
43	21X31A0543	63
44	21X31A0544	30
45	21X31A0545	74
46	21X31A0546	33
47	21X31A0547	56
48	21X31A0548	70
49	21X31A0549	66
50	21X31A0550	65
51	21X31A0552	60
52	21X31A0554	74
53	21X31A0555	67
54	21X31A0556	56
55	21X31A0557	70
56	21X31A0559	70
57	21X31A0560	74
58	21X31A0561	63
59	21X31A0562	61
60	21X31A0563	59
61	21X31A0564	69
62	21X31A0565	68
63	22X35A0501	70
64	22X35A0501	60
65	22X35A0502 22X35A0503	43
66	22X35A0505	68
67	22X35A0505 22X35A0506	65
68	22X35A0500 22X35A0507	 58
69		
	22X35A0508	70

Max Marks	75			
Class Average mark	62			
Number of students performed above the target				
Number of successful stu	44 69			
Percentage of students sc	64%			
Attainment level	2			

Attainment Level	% students
1	60%
2	70%
3	>80%



Department of Computer Science and Engineering

Course Outcome Attainment

Name of the faculty: B S SWAPNA SHANTHI Academic Year: 2022-23

Branch & Section: CSE-A Examination: Year / Semester:

Course Name: JAVA PROGRAMMING LAB Year: II
Semester: II

1st **Course Outcomes** Internal 2nd Internal Internal Attainment Level Exam **Exam** Exam **University Exam** CO₁ 3.00 3.00 3.00 2.00 2.30 CO₂ 3.00 3.00 3.00 2.00 2.30 CO₃ 3.00 3.00 3.00 2.00 2.30 **CO4** 3.00 3.00 3.00 2.00 2.30 CO₅ 3.00 3.00 3.00 2.00 2.30 3.00 **CO6** 3.00 3.00 2.00 2.30 **Internal & University Attainment:** 3.00 2.00 Weightage 30% 70% **CO** Attainment for the course (Internal, University) 0.90 1.40 **CO** Attainment for the course (Direct Method) 2.30

Overall course attainment level

2.30



Department of Computer Science and Engineering Program Outcome Attainment (from Course)

Name of Faculty: B S SWAPNA SHANTHI Academic Year: 2022-2023

Branch & Section: CSE-A Year: II

Course Name: JAVA PROGRAMMING LAB Semester: II

CO-PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
CO1	1	-	3	-	2	-						-	2	2
CO2	-	2	3	-	2	1						•	2	
CO3	1	2	-	-	3	-						-	-	-
CO4	-	-	3	2	-	-						1	3	-
CO5	-	3	2	-	-	-						1	-	2
CO6	3	-	2	1	-	-						-	-	-
Course	1.7	2.3	2.6	1.5	2.3	1.0						1.0	2.3	2.0

со	Course Outcome Attainment	
	2.30	
CO1		
	2.30	
CO2		
	2.30	
CO3		
	2.30	
CO4		
	2.30	
CO5		
CO6	2.30	
Overall course attainment level	2.30	

PO-ATTAINMENT

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
CO											·			
Attainme														
nt	1.28	1.79	1.99	1.15	1.79	0.77						0.77	1.79	1.53

CO contribution to PO - 33%, 67%, 100% (Level 1/2/3)