GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY: NELLORE

DEPARTMENT OF (CSE : AIML : CS & DS)

Laboratory -1

Name of the Physical Lab: Computer Center Laboratory -1 | **Year & Semester: 2024-25 & II**

LAB OCCUPANCY CHART 2024 -25

PERIODS	I	II	III	IV		V	VI	VII
HOURS	9:00-10:00	10:00 -10:55	11:10-12:05	12:05-1:00		1:45-2:40	2:40-3:35	3:35-4:30
MON		II AIML – B DBMS LAB			BREAK			
TUE		II AIML -B FS LAB				II DS – DBMS LAB		
WED		II CSE-C FS LAB				II CSE – B DBMS LAB		
THU		II AIML A FS LAB				II CS – DBMS LAB		
FRI		II AIML A DBMS LAB				II CSE C DBMS LAB		
SAT		II CS FS LAB				II CSE A DBMS LAB		

DBMS AND FULL STACK LAB

Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch	Sl. No	Name of the Lab	Name of the Faculty 1 & 2	Branch
1	**II CSE -C -FS LAB**	Ms. V.Pavithra	**CSE**	7	**II CSE A DBMS LAB**	Mr DVH Venukumar / Mr Ch Bharath Singh	**CSE**
2	**II AIML A DBMS LAB**	Ms SK.Raqueeba/ Mr S.Rajasekhar	**CSE -AIML**	8	**II CSE – B DBMS LAB**	Mr K Balakrishna/ Ch.Bharath singh	**CSE**
3	**II AIML – B DBMS LAB**	Ms S.Sahaja / Mr S.Rajasekhar	**CSE-AIML**	9	**II CSE C DBMS LAB**	Mr K Balakrishna / Mr Ch.Bharath Singh	**CSE**
4	**II CS -FS LAB**	Ms N.Sireesha	CSE (CS)	10	**II DS - DBMS LAB**	Mr T.Sai Prasad Reddy / Mr M.Venkateswarlu	CSE(DS)
5	**II CS - DBMS LAB**	Mr T.Sai Prasad Reddy / Mr M.Venkateswarlu	CSE (CS)	11	**II AIML -A FS LAB**	Mr SK.Rasool	CSE- AIML
6	**II AIML - B FS LAB**	Mr SK.Rasool	**CSE-AIML**				

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY: NELLORE

DEPARTMENT OF (CSE : AIML : CS & DS)

Laboratory - 2

Name of the Physical Lab: Computer Center Laboratory -2 | **Year & Semester: 2024-25 & II**

LAB OCCUPANCY CHART 2024 -25

PERIODS	I	II	III	IV		V	VI	VII
HOURS	9:00-10:00	10:00 -10:55	11:10-12:05	12:05-1:00		1:45-2:40	2:40-3:35	3:35-4:30
MON	II CSE-A FS LAB		II CSE-B FS LAB		BREAK			
TUE		II-CS-CN LAB						
WED		II AIML A ML LAB				II DS - EDAP LAB		
THU		II DS DE LAB				II CSE C OS LAB		
FRI		II CSE A OS LAB				II AIML B ML LAB		
SAT		II EEE PP LAB				II CSE B OS LAB		

OS , PP, ML, DE LAB

Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch	Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch
1	**II CSE -A -FS LAB**	Ms. V.Pavithra	**CSE**	6	**II CSE A OS LAB**	Mr.Y.V. Ramesh / Ms K.Sreeja	**CSE**
2	**II CSE -B -FS LAB**	Ms. V.Pavithra	**CSE**	7	**II CSE B OS LAB**	Mr.Y.V. Ramesh / Ms K.Sreeja	**CSE**
3	**II DS - DE LAB**	Mr. V.Chaitanya / Mr. S.Rajasekhar	**CSE (CS)**	8	**II CSE C OS LAB**	Mr.Y.V. Ramesh/ Ms K.Sreeja	**CSE**
4	**II EEE PP LAB**	Ms Teesa Davis	EEE	9	**II AIML A ML**	Ms. N.Siva Nagamani/ Ms D.Saritha	CSE - (AIML)
5	**II DS - EDAP LAB**	Mr Sk.Nazeer	CSE (DS)	10	**II AIML B ML**	Ms. N.Siva Nagamani/ Ms D.Saritha	CSE - (AIML)

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY: NELLORE

DEPARTMENT OF (CSE : AIML : CS & DS)

Laboratory - 3

Name of the Physical Lab: Computer Center Laboratory 3 | **Year & Semester: 2024-25 & II**

LAB OCCUPANCY CHART 2024 -25

PERIODS	I	II	III	IV		V	VI	VII
HOURS	9:00-10:00	10:00 - 10:55	11:10-12:05	12:05-1:00	BREAK	1:45-2:40	2:40-3:35	3:35-4:30
MON						III-CS-CC LAB		
TUE		III- CS- DF LAB						
WED		III-AML-A- NLP LAB				III AML B -AML LAB		
THU		III-DS BDA LAB				III AML A -CV LAB		
FRI		III AML A - AML LAB						
SAT		III AML B- NLP LAB				III AML-B CV LAB		

NLP , CV, CC , DF & AML LAB

Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch	Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch
1	III- CS- DF LAB	Mr K.Chiranjeevi / Mr D.Srihari Naidu	CSE-CS	7	III AML B -CV LAB	Ms V.Bharathi / K.Rani	CSE- AIML
2	III-CS-CC LAB	Mr D.Ramesh / Ch. Ashok Kumar	CSE-CS	8	III AML B -NLP LAB	Dr Babu.P / Ms. Teesa Devis	CSE- AIML
3	III-DS BDA LAB	Mr SK.Asiff / Mr P.Ramesh	CSE-DS	9	III AML B-AML-LAB	Dr N.Sai sindhuri / Ms Kamakshamma	CSE- AIML
4	III AML A -CV LAB	Ms V.Bharathi / K.Rani	CSE- AIML				
5	III AML A -NLP LAB	Dr Babu.P / Ms.P.Lakshmi	CSE- AIML				
6	III AML A -AML-LAB	Dr N.Sai sindhuri / Ms Kamakshamma	CSE- AIML				

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY: NELLORE

DEPARTMENT OF (CSE : AIML : CS & DS)

Laboratory - 4

Name of the Physical Lab: Computer Center Laboratory-4 | **Year & Semester:** 2024-25 , II

LAB OCCUPANCY CHART 2024 -25

PERIODS	I	II	III	IV		V	VI	VII
HOURS	9:00-10:00	10:00 - 10:55	11:10-12:05	12:05-1:00		1:45-2:40	2:40-3:35	3:35-4:30
MON		III CSE-A ML LAB			BREAK	III CSE-C-CD-LAB		
TUE		III CSE-B ML LAB				III - DS- DATA VISUALIZATION LAB		
WED		III CSE-C ML LAB				III CSE-B-CD-LAB		
THU		III CSE-A CC LAB				III CSE-C CC LAB		
FRI		III-CS- PTCO LAB				III CSE A CD LAB		
SAT		III DS- CC LAB				III CSE-B CC LAB		

CD, PTOCO LAB

Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch	Sl.No	Name of the Lab	Name of the Faculty 1 & 2	Branch
1	III CSE-A ML LAB	Ms R.Deepthi / Mr K.Bhargav	CSE	7	III CSE-B CC LAB	Mr U Satyanarayana / Ms P.Saravani	CSE
2	III CSE-A CD LAB	Ms K.Poojitha / Mr Sk.Dowlath	CSE	8	III CSE-C- ML LAB	Mr Sk.Asiff / P.Ramesh	CSE
3	III CSE-A CC LAB	Mr DVH Venukumar / Mr SK.Nazeer	CSE	9	III CSE-C-CD LAB	Ms B.Varalakshmi / K.Usha	CSE
4	III CSE-B ML LAB	Ms R.Deepthi / Mr K.Bhargav	CSE	10	III CSE-C- CC LAB	Mr U Satyanarayana / Ms P.Saravani	CSE
5	III CSE-B CD LAB	Ms K.Poojitha / Mr Sk.Dowlath	CSE	11	III DS-CC LAB	Mr D.Ramesh / Ch.Ashok Kumar	CSE-DS
6	III CS- PTCO LAB	Mr A.Ramesh / Mr M.Rajeswari	CSE-CS	12	III DS-DV LAB	Mr V.Chaitanya / Mr B.Ramamurthy	CSE-DS

Laboratory-2

RG 23 Regulations

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

OPERATING SYSTEMS LAB
(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
23A0514P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	PCC

Course Objectives:

This course will enable students to:

- Provide insights into system calls, file systems, semaphores,
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation
- Implement Bankers Algorithms to Avoid the Dead Lock

Course Outcomes(CO):

On completion of this course, student will be able to

- Trace different CPU Scheduling algorithms (L2).
- Implement Bankers Algorithms to Avoid the Dead Lock (L3).
- Evaluate Page replacement algorithms (L5).
- Illustrate the file organization techniques (L4).
- Illustrate Inter process Communication and concurrent execution of threads (L4)

Experiments: **Total Hours:48**

Week-1:

1. Practicing of Basic UNIX Commands.

Week-2:

2. Write programs using the following UNIX operating system callsfork, exec, getpid, exit, wait, close, stat, opendir and readdir

Week-3:

3. Simulate UNIX commands like cp, ls, grep, etc.,

Week-4:

4. Simulate the following CPU scheduling algorithms
   a)FCFS b) SJF c) Priority d) Round Robin

Week-5:

5. Control the number of ports opened by the operating system with
   a)Semaphore b) Monitors.

Week-6:

6. Write a program to illustrate concurrent execution of threads using pthreads library.

Week-7:

7. Write a program to solve producer-consumer problem using Semaphores.

Week-8:

8. Implement the following memory allocation methods for fixed partition
   a)First fit b) Worst fit c) Best fit

Week-9:

9. Simulate the following page replacement algorithms
   a)FIFO b) LRU c) LFU

Week-10:

10. Simulate Paging Technique of memory management.

Week-11:

11. Implement Bankers Algorithm for Dead Lock avoidance and prevention

Week-12:

12. Simulate the following file allocation strategies
    a)Sequential b) Indexed c) Linked

Experiments covering the Topics:

- UNIX fundamentals, commands & system calls
- CPU Scheduling algorithms, thread processing
- IPC, semaphores, monitors, deadlocks
- Page replacement algorithms, file allocation strategies
- Memory allocation strategies

Reference Books:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley,2018.
2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
3. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson,2018
   Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition,McGraw- Hill, 2013

Web References:

1. https://www.cse.iitb.ac.in/~mythili/os/
2. http://peterindia.net/OperatingSystems.html
3. https://nptel.ac.in/courses/106/106/106106144/

Laboratory - 1

RG 23 Regulations

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
23A0515P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	PCC

Course Objectives:

This course will enable students to:

- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers.

Course Outcomes(CO):

On completion of this course, student will be able to

- Utilizing Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language (DCL) commands effectively within a database environment (L3)
- Constructing and execute queries to manipulate and retrieve data from databases. (L3)
- Develop application programs using PL/SQL. (L3)
- Analyze requirements and design custom Procedures, Functions, Cursors, and Triggers, leveraging their capabilities to automate tasks and optimize database functionality (L4)
- Establish database connectivity through JDBC (Java Database Connectivity) (L3)

Experiments: **Total Hours:48**

Week-1:

1. Creation, altering and droping of tables and inserting rows into a table (use constraintswhile creating tables) examples using SELECT command.

Week-2:

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.

Week-3:

3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Week-4:

4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between,least, greatest, trunc, round, to_char, to_date)

Week-5

5.
   i. Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can beselected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

Week-6:

6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

Week-7:

7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.

Week-8:

8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

Week-9:

9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

Week-10:

10. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

Week-11:

11. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

Week-12:

12. Create a table and perform the search operation on table using indexing and non-indexing techniques.

Week-13:

13. Write a Java program that connects to a database using JDBC

Week-14:

14. Write a Java program to connect to a database using JDBC and insert values into it

Week-15:

15. Write a Java program to connect to a database using JDBC and delete values from it

Experiments covering the topics:

- DDL, DML, DCL commands
- Queries, nested queries, built-in functions,
- PL/SQL programming- control structures
- Procedures, Functions, Cursors, Triggers,
- Database connectivity- ODBC/JDBC

Text Books:

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007
3. Rick F Vander Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY

Unit of USHODAYA EDUCATIONAL SOCIETY

An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956

3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137

Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

FULL STACK DEVELOPMENT – 1

(Skill Enhancement Course)

(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
23A0516P	0:1:2:0	2	CIE: 30 SEE:70	3 Hours	SEC

Course Objectives:

This course will enable students to:

- Make use of HTML elements and their attributes for designing static web pages
- Build a web page by applying appropriate CSS styles to HTML elements
- Experiment with JavaScript to develop dynamic web pages and validate forms

Course Outcomes(CO):

On completion of this course, student will be able to

- CO1: Design Websites. (L6)
- CO2: Apply Styling to web pages. (L4)
- CO3: Make Web pages interactive. (L6)
- CO4: Design Forms for applications. (L6)
- CO5: Choose Control Structure based on the logic to be implemented. (L3)
- CO6: Understand HTML tags, Attributes and CSS properties (L2)

Experiments: **Total Hours:48**

1. Lists, Links and Images

a. Write a HTML program, to explain the working of lists.
Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.

b. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.

c. Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.

d. Write a HTML program, in such a way that, rather than placing large images on a page,the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this technique

2. HTML Tables, Forms and Frames

- Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>, **<td> and attributes: border, rowspan, colspan)**
- Write a HTML program, to explain the working of tables by preparing a timetable. (Note: Use <caption> tag to set the caption to the table & also use cell spacing, cell padding, border, rowspan, colspan etc.).
- Write a HTML program, to explain the working of forms by designing Registration form. (Note: Include text field, password field, number field, date of birth field, checkboxes, radio buttons, list boxes using <select>&<option> tags, <text area> and two buttons ie: submit and reset. Use tables to provide a better view).
- Write a HTML program, to explain the working of frames, such that page is to be divided into 3 parts on either direction. (Note: first frame image, second frame paragraph, third frame □ hyperlink. And also make sure of using "no frame" attribute such that frames tobe fixed).

3. HTML 5 and Cascading Style Sheets, Types of CSS

a. Write a HTML program, that makes use of <article>, <aside>, <figure>, <figcaption>,

<footer>, <header>, <main>, <nav>, <section>, , tags.

b. Write a HTML program, to embed audio and video into HTML web page.

c. Write a program to apply different types (or levels of styles or style specification formats) **- inline, internal, external styles to HTML elements. (identify selector, property and value).**

4. Selector forms

a. Write a program to apply different types of selector forms
- Simple selector (element, id, class, group, universal)
- Combinator selector (descendant, child, adjacent sibling, general sibling)
- Pseudo-class selector
- Pseudo-element selector
- Attribute selector

5. CSS with Color, Background, Font, Text and CSS Box Model

a. Write a program to demonstrate the various ways you can reference a color in CSS.

b. Write a CSS rule that places a background image halfway down the page, tilting it horizontally. The image should remain in place when the user scrolls up or down.

c. Write a program using the following terms related to CSS font and text:
i. font-size ii. font-weight iii. font-style
iv. text-decoration v. text-transformation vi. text-alignment

d. Write a program, to explain the importance of CSS Box model using
i. Content ii. Border iii. Margin iv. padding

6. Applying JavaScript - internal and external, I/O, Type Conversion

a. Write a program to embed internal and external JavaScript in a web page.

b. Write a program to explain the different ways for displaying output.

c. Write a program to explain the different ways for taking input.

d. Create a webpage which uses prompt dialogue box to ask a voter for his name and age.Display the information in table format along with either the voter can vote or not

7. JavaScript Pre-defined and User-defined Objects

a. Write a program using document object properties and methods.

b. Write a program using window object properties and methods.

c. Write a program using array object properties and methods.

d. Write a program using math object properties and methods.

e. Write a program using string object properties and methods.

f. Write a program using regex object properties and methods.

g. Write a program using date object properties and methods.

h. Write a program to explain user-defined object by using properties, methods, accessors, constructors and display.

8. JavaScript Conditional Statements and Loops

a. Write a program which asks the user to enter three integers, obtains the numbers from the user and outputs HTML text that displays the larger number followed by the words "LARGER NUMBER" in an information message dialog. If the numbers are equal, output HTML text as "EQUAL NUMBERS".

b. Write a program to display week days using switch case.

c. Write a program to print 1 to 10 numbers using for, while and do-while loops.

d. Write aprogram to print data in object using for-in, for-each and for-of loops

e. Develop a program to determine whether a given number is an 'ARMSTRONG NUMBER' or not. [Eg: 153 is an Armstrong number, since sum of the cube of the digits isequal to the number i.e.,13 + 53+ 33 = 153]

f. Write a program to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Eg: If deposited amount is Rs.163, the output should be 1-100's, 1-50's, 1- 10's, 1-2's & 1-1's)

9. Javascript Functions and Events

a. Design a appropriate function should be called to display
   - Factorial of that number
   - Fibonacci series up to that number
   - Prime numbers up to that number
   - Is it palindrome or not

b. Design a HTML having a text box and four buttons named Factorial, Fibonacci, Prime,and Palindrome. When a button is pressed an appropriate function should be called to display
   11. Factorial of that number
   12. Fibonacci series up to that number
   13. Prime numbers up to that number
   14. Is it palindrome or not

c. Write a program to validate the following fields in a registration page
   i. Name (start with alphabet and followed by alphanumeric and the length should notbe less than 6 characters)
   ii. Mobile (only numbers and length 10 digits)
   iii. E-mail (should contain format like xxxxxxx@xxxxxx.xxx)

Experiments covering the Topics:

- Lists, Links and Images
- HTML Tables, Forms and Frames
- HTML 5 and Cascading Style Sheets, Types of CSS
- Selector forms
- CSS with Color, Background, Font, Text and CSS Box Model
- Applying JavaScript - internal and external, I/O, Type Conversion
- JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
- JavaScript Functions and Events
- Node.js

Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, andNode, Vasan Subramanian, 2nd edition, APress, O'Reilly.

Web References:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs
5. https://www.w3schools.com/typescript

Laboratory 4

RG 22 Regulations

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY

Unit of USHODAYA EDUCATIONAL SOCIETY

An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956

3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137

Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

COMPILER DESIGN LAB

(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0531P	0: 0:3:0	1.5	CIE: 30 SEE:70	3 Hours	PCC

Course Objectives:

This course will enable students :

- To introduce LEX and YACC tools
- To learn to develop algorithms to generate code for a target machine
- To implement LL and LR parsers

Course Outcomes(CO):

On completion of this course, student will be able to:

- Design and implement fundamental concepts of finite Automata
- Design and implement a lexical analyzer for given language
- Use LEX and YACC tools for developing a scanner and a parser
- Design and implement LL and LR parsers
- Design algorithms to perform code optimization in order to improve the performance of program
- Design and implement code generation for given expression

Syllabus | **Total Hours:48**

List of Experiments:

Experiment 1: Write program to find ε – closure of all states of any given NFA with ε transition.
Experiment 2: Write program to convert NFA with ε transition to NFA without ε transition.
Experiment 3: Write program to convert NFA to DFA
Experiment 4: Design and implement a lexical analyzer for given language using C and the lexical analyzer should ignore redundant spaces, tabs and new lines.
Experiment 5: Implementation of Lexical Analyzer using Lex Tool
Experiment 6: Program to recognize a valid arithmetic expression that uses operator +, – , * and /.
Experiment 7: Implementation of Calculator using LEX and YACC
Experiment 8: Write program to find Simulate First and Follow of any given grammar.
Experiment 9: Construct a recursive descent parser for an expression.
Experiment 10 Construct a Shift Reduce Parser for a given language.
Experiment 11: Write a program to perform constant propagation.
Experiment 12: Implement Intermediate code generation for simple expressions

Reference Books:

- Compilers: Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman, Pearson. Compiler Construction-Principles and Practice, Kenneth C Louden, Cengage Learning.
- Modern compiler implementation in C, Andrew W Appel, Revised edition, Cambridge University Press.
- The Theory and Practice of Compiler writing, J. P. Tremblay and P. G. Sorenson, TMH
- Writing compilers and interpreters, R. Mak, 3rd edition, Wiley student edition.

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137

MACHINE LEARNING LAB
(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0532P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	PCC

Course Objectives:

This course will enable students to:

- Make use of Data sets in implementing the machine learning algorithms
- Implement the machine learning concepts and algorithms in any suitable language of choice.

Course Outcomes(CO):

On completion of this course, student will be able to

- Understand the Mathematical and statistical prospective of machine learning algorithms through python programming
- Appreciate the importance of visualization in the data analytics solution
- Derive insights using Machine learning algorithms

Syllabus — **Total Hours:48**

List of Experiments

Experiment 1:
Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

Experiment 2:
For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.

Experiment 3:
Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.

Experiment 4:
Build an Artificial Neural Network by implementing the Back-propagation algorithm and test the same using appropriate data sets.

Experiment 5:
Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.

Experiment 6:
Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.

Experiment 7:
Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.

Experiment 8:
Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.

Experiment 9:
Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.

Experiment 10:
Implement parametric and non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

Reference Book:

1. Python Machine Learning Workbook for beginners, AI Publishing, 2020

Web Reference:

1. **https://www.udemy.com/course/machinelearning/**

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

CLOUD COMPUTING LAB
(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0533P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	PCC

Course Objectives:

This course will enable students to:

- To develop web applications in cloud
- To learn the design and development process involved in creating a cloud based application
- Understand transfer of file form one virtual machine to another
- To learn to implement and use parallel programming using Hadoop

Course Outcomes(CO):

On completion of this course, student will be able to

- Configure various virtualization tools such as Virtual Box, VMware workstation.
- Design and deploy a web application in a PaaS environment.
- Learn how to simulate a cloud environment to implement new schedulers.
- Install and use a generic cloud environment that can be used as a private cloud.
- Manipulate large data sets in a parallel environment.

Syllabus | **Total Hours:48**

List of Experiments

Experiment 1:
Install VirtualBox/VMware Workstation with different flavours of Linux or windows OS on top of windows operating systems.

Experiment 2:
Install a C compiler in the virtual machine created using virtual box and execute Simple Programs

Experiment 3:
Install Google App Engine. Create hello world app and other simple web applications using python/java.

Experiment 4: Use GAE launcher to launch the web applications.

Experiment 5:
Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.

Experiment 6: Find a procedure to transfer the files from one virtual machine to another virtual machine.

Experiment 7:
Find a procedure to launch virtual machine using try stack (Online Open stack Demo Version)

Experiment 8: Install Hadoop single node cluster and run simple applications like word count

Reference:

1. Google Cloud Computing Foundations Course - Course (nptel.ac.in)

Web References:

1. https://www.vmware.com/products/workstation-pro/workstation-pro-evaluation.html
2. http://code.google.com/appengine/downloads.html
3. http://code.google.com/appengine/downloads.html

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

NATURAL LANGUAGE PROCESSING LAB
(Common to CSE, AI&ML, DS, CS)

Course Code	L: T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A3308P	0: 0:3:0	1.5	CIE: 30 SEE:70	3Hours	PCC(Lab)

Course Objectives:

This course will enable students to:

- Introduce the students with the basics of NLP which will empower them for developing advanced NLP tools and
- Solving practical problems in the field of Natural Language Processing.

Course Outcomes (CO):

On completion of this course, the studenst will be able to:

- Understand approaches to syntax and semantics in NLP(L2)
- Analyze grammar formalism and context free grammars(L4)
- Apply the statistical estimation and statistical alignment models(L3)
- Apply Rule based Techniques, Statistical Machine translation (SMT), Word alignment, Phrase based translation (L3)
- Have the skills (experience) of solving specific NLP tasks, which may involve programming in Python, as well as running experiments on textual data. (L3)

Syllabus	Total Hours:48

List of Experiments:

Experiment-1: Word Analysis
Experiment-2: Word Generation
Experiment-3: Morphology
Experiment-4: N-Grams
Experiment-5: N-Grams Smoothing
Experiment-6: POS Tagging: Hidden Markov Model
Experiment-7: POS Tagging: Viterbi Decoding
Experiment-8: Building POS Tagger
Experiment-9: Chunking
Experiment-10: Building Chunker

Reference Books:

1. James Allen, “Natural Language Understanding”, 2nd Edition, 2003, Pearson Education.
2. Akshar Bharathi, Vineet Chaitanya, “Natural Language Processing: A paninian perspective”, Prentice –Hall of India.

Web References:

1. Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in)
2. Natural Language Processing in TensorFlow | Coursera

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

Advanced Machine Learning Lab
(AI & ML)

Course Code	L: T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A3309P	0:0:3:0	1.5	CIE: 30 SEE:70	3Hours	PCC(Lab)

Course Objectives:

This course will enable students to:

- Study various learning algorithms
- Make use of Data sets in implementing the machine learning algorithms
- Implement the machine learning concepts and algorithms in any suitable language ofchoice
- Learn about feature engineering
- To develop skills of using recent machine learning packages for solving practical problems.

Course Outcomes:

On completion of this course, the students will be able to:

- Apply Supervised Learning techniques to deal with unlabelled data(L3)
- Apply Unsupervised Learning techniques to handle complex data(L3)
- Apply Regression techniques for prediction of numerical feature values(L3)
- Analyze data using python libraries Implement an end to end Machine Learning System(L4)

Syllabus — **Total Hours:48**

1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school daysin a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result.
2. Create a K-Means Clustering Algorithm from Scratch in Python?
3. Implement k-nearest neighbours classification using python
4. Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the resultof k-means clustering with 3 means (i.e., 3 centroids) VAR1 VAR2 CLASS 1.713 1.586 0 0.180 1.786 1 0.353 1.240 1 0.940 1.566 0 1.486 0.759 1 1.266 1.106 0 1.540 0.419 1 0.459 1.799 1 0.773 0.186 1
5. The following training examples map descriptions of individuals onto high, medium and low credit-worthiness.

Income	Recreation	Job	Status	Age group	Home - owner	Risk
Medium	skiing	design	single	twenties	no	High risk
High	golf	trading	married	forties	yes	Low risk
Low	speedway	transport	married	thirties	yes	Med risk

Medium	football	banking	single	thirties	yes	Low risk
High	flying	media	married	fifties	yes	High risk
Low	football	security	single	twenties	no	Med risk
Medium	golf	media	single	thirties	yes	Med risk
Medium	golf	transport	married	forties	yes	Low risk
High	skiing	banking	single	thirties	yes	High risk
Low	golf	unemployed	married	forties	yes	High risk

Input attributes are (from left to right) income, recreation, job, status, age group, home-owner. Find the unconditional probability of `golf' and the conditional probability of `single' given `med Risk' in the dataset?

6. Implement linear regression using python.
7. Build an Artificial Neural Network by implementing the Back-propagation algorithm and testthe same using appropriate data sets.
8. Implement Naïve Bayes' theorem to classify the English text
9. Use the appropriate dataset for implementing feature engineering for machine learning to find
   - Missing data imputation
   - Categorical encoding
   - Outliers
   - Feature scaling
   - Mixed variables
10. Design an Optical Character Recognizer

References:

1. John hearty, "Advanced Machine Learning with python" ,2016
2. Aurelian Ger," Hands-On Machine Learning with Scikit-Learn and Tensor Flow" (2nd Edition), 2020
3. Y. S. Abu-Mostafa, M. Magdon-Ismail, H.-T. Lin, "Learning from Data: A Short Course", First Edition, 2012
4. C. M. Bishop," Pattern Recognition and Machine Learning", First Edition. Springer, 2006. (Second Indian Reprint, 2015).
5. S. J. Russell, P. Norvig," Artificial Intelligence: A Modern Approach", Third Edition, Prentice- Hall, 2010.

Online Learning Resources/Virtual Labs:

https://github.com/jiadaizhao/Advanced-Machine-Learning-Specialization.

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

COMPUTER VISION LAB					
Course Code	**L: T:P:S**	**Credits**	**Exam Marks**	**Exam Duration**	**Course Type**
22A3310P	**0:0:3:0**	**1.5**	**CIE: 30 SEE:70**	**3Hours**	**PCC(Lab)**

Course Objectives:

On completion of this course, the students are able to:

- Study the fundamentals, mathematical transforms necessary for Image Processing
- Understand various Image processing techniques
- Apply different transformation techniques on images

Syllabus	**Total Hours:48**

1. Develop a Python program to convert RGB image into Grayscale Image
2. Develop a Python Program to perform Thresholding on an Input Image
3. Develop a Python Program to perform gray level Slicing without background
4. Develop a Python Program to perform gray level Slicing with background
5. Develop a Python Program to perform Bit Plane Slicing
6. Develop a Python Program to display Histogram of an Image
7. Develop a Python Program to perform Log transformation of an Image
8. Develop a Python Program to implement an Ideal Low Pass Filter
9. Develop a Python Program to implement Butterworth Low Pass Filter
10. Develop a Python Program for detecting edges of an Image
11. Develop a Python Program for blurring an Image
12. Develop a Python Program for overlaying an image on another image
13. Develop a Python for extracting text from an Image

References:

Jan Erik Solem "Programming Computer Vision with Python ", Creative Commons

Online Learning Resources/Virtual Labs:
https://neptune.ai/blog/image-processing-python
https://www.tutorialspoint.com/image-processing-in-python

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

BIG DATA ANALYTICS LAB
Department of Computer Science and Engineering (Data Science)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A3207P	0:0:3:0	1.5	CIE:30 SEE:70	3 Hours	PCC

Course Objectives:

This course will enable students to:

- Get familiar with Hadoop distributions, configuring Hadoop and performing File management tasks
- Experiment MapReduce in Hadoop frameworks
- Implement MapReduce programs in variety applications
- Explore MapReduce support for debugging
- Understand different approaches for building Hadoop MapReduce programs for real time application

Course Outcomes (CO):

On completion of this course, student will be able to

CO1.Use Hadoop and perform File Management Tasks
CO2.Apply MapReduce programs to real time issues like word count, weather dataset and sales of a company
CO3. analyze huge data set using Hadoop distributed file systems and MapReduce
CO4. Apply data processing tool Pig
CO5. Apply data processing tool Hive
CO6. Apply data processing tool Spark

Syllabus | **Total Hours:48**

1. Install Apache Hadoop
2. Develop a MapReduce programto calculate the frequency of a given word in agiven file.
3. Develop a MapReduce program to find the maximum temperature in each year.
4. Develop a MapReduce program to find the grades of students.
5. Develop a MapReduce to find the maximum electrical consumption in each year given electrical consumption for each month in each year.
6. Develop a MapReduce to analyze weather data set and print whether the day is shinny or cool day.
7. Develop a MapReduce program to find the number of products sold in each country by considering sales data containing fields like

Tranctio n_Date	Pro duct	Pri ce	Payment _Type	Na me	Ci ty	St ate	Cou ntry	Account_ Created	Last_ Login	Latit ude	Longi tude

8. XYZ.com is an online music website where users listen to various tracks, the data gets collected which is given below. The data is coming in log files and looks like as shown below

UserId	TrackId	Shared	Radio	Skip
111115	222	0	1	0
111113	225	1	0	0
111117	223	0	1	1
111115	225	1	0	0

Write a MapReduce program to get the following

- Number of unique listeners
- Number of times the track was shared with others
- Number of times the track was listened to onthe radio
- Number o
- Number of

9. Deve he people
   (both h class.

The titanic data will be..

Column 1 :PassengerI d
Column 2 : Survived (survived=0 &died=1)
Column 3 :Pclass
Column 4 : Name
Column 5 : Sex
Column 6 : Age
Column 7 :SibSp
Column 8 :Parch
Column 9 : Ticket
Column 10 : Fare
Column 11 :Cabin
Column 12 : Embarked

10. Develop a program to calculate the maximum recorded temperature by yearwise for the weather dataset in Pig Latin

11. Write queries to sort and aggregate the data in a table using HiveQL.

12. Develop a Java application to find the maximum temperature using Spark

Text Book(s):

1. Tom White, "Hadoop: The Definitive Guide" Fourth Edition, O'reilly Media, 2015.

Reference Book(s):

1. Glenn J. Myatt, Making Sense of Data , John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O'Reilly, 2011.
2. Michael Berthold, David J.Hand, Intelligent Data Analysis, Spingers, 2007.
3. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, Uderstanding Big Data : Analytics for Enterprise Class Hadoop and Streaming Data, McGrawHill Publishing, 2012.
4. Anand Rajaraman and Jeffrey David UIIman, Mining of Massive Datasets Cambridge University Press, 2012.

Web Reference:

https://www.ibm.com/analytics/big-data-analytics#:~:text=Big%20data%20analytics%20is%20the,sizes%20from%20terabytes%20to%20

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

DATA VISUALIZATIONLAB
(Common to CSE, AI&ML, DS, CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A3208P	**0:0:3:0**	**1.5**	**CIE:30 SEE:70**	**3 Hours**	**PCC**

Course Objectives:

This course will enable students to:

- Familiarize with data visualization concepts
- Learn the data visualization principles
- Learn the concepts of plots
- Learn the concepts of data visualization via kernel machines
- Familiarize the data visualization for applications

Course Outcomes (CO):

On completion of this course, student will be able to

- Understand the dvconcepts (L2).
- Apply various graphs and plots for data visualization (L3).
- Applythe matrix visualization for cluster analysis (L3)
- Analyze the kernel Machine in cluster analysis (L4).
- Apply various operations for genetic algorithms (L3).
- Illustrate the data visualization techniques for applications (L2).

Syllabus	Total Hours:48

1: Introduction to R
   a. Overview of R and Rstudio
   b. R syntax and Basic Operations
   c. Managing and navigating the R Environment

2: Data structures in R
- Vectors: a. Creation
   b. Indexing
   c. Basic arithmetic operations

3: Data Frames in R
   a. Creating
   b.Subsetting
   c. Manipulating

4: Data Manipulation in R
   a. Data import and Export in R
   b. Cleaning and Preprocessing data
   c. Manipulating data using functions from package like dplyr

5: Basic statistical operations
   a. Descriptive statistics (Mean, Median, Variance)
   b. Probability distributions in R
   c. Hypothesis testing (t-testing, chi-square tests)

6: Data Visualization in R

a. Introduction to basic plotting functions in R(plot, hist, boxplot)
b. Customizing plots (adding title, lables, legends)
c. Visualization methods-(categorical and continuous variables

7: Write a R programto display first 10 Fibonacci numbers
8: Write a R programto print the numbers from 1-100 and print "gist" for multiple of 3 print "GIST" for multiple of 5 and print "gist GIST" for multiple of both
9: Write a R program to create a data frame which contains details of 10 employees and display and summary of data

Reference Books:

Better data visualizations- A gude for scholars, researchers and wonks-Jonathan schwabish- Columbia university Press

Visualizing data-O' Relly

Web Reference:

https://www.tableau.com/learn/articles/data-visualization

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

DIGITAL FORENSICS LAB					
Course Code	**L:T:P:S**	**Credits**	**Exam Marks**	**Exam Duration**	**Course Type**
22A3708P	**0:0:3:0**	**1.5**	**CIE:30 SEE:70**	**3Hours**	

Course Objectives:

This course will enable students to:

- To provide students with a comprehensive overview of collecting, investigating, preserving, and presenting evidence of cyber crime left in digital storage devices, emails, browsers, mobile devices using different Forensics tools.

- To understand the network analysis ,Registry analysis and analyze attacks using different forensics tools.

Syllabus	Total Hours: 42

List of Experiments

Exercise – 1:
Perform email analysis using the tools like Exchange EDB viewer , MBOX viewer and View user mailboxes and public folders , Filter the mailbox data based on various criteria, Search for particular items in user mailboxes and public folders.

Exercise – 2:
Perform Browser history analysis and get the downloaded content , history ,saved logins, searches, websites visited etc using Foxton Forensics tool, Dumpzilla.

Exercise – 3:
Perform mobile analysis in the form of retrieving call logs , SMS log ,all contacts list using the forensics tool like SAFT.

Exercise – 4:
Perform Registry analysis and get boot time logging using process monitor tool.

Exercise – 5:
Perform Disk imaging and cloning the using the X-way Forensics tools.

Exercise- 6 :
Perform Data Analysis i.e. History about open file and folder, and view folder actions using Last view activity tool.

Exercise-7 :
Perform Network analysis using the Network Miner tool.

Exercise-8 :
Perform information for incident response using the Crowd Response Tool.

Exercise-9 :
Perform File type detection using Auto spy tool.

Exercise-10 :
Perform Memory capture analysis using the Live RAM capture or any forensic Tool.

.

Course Outcomes:

After completion of this course, students will be able to:

- Learn the importance of a systematic procedure for investigation of data found on digital storage media that might provide evidence of wrong-doing.
- To learn the file system storage mechanisms and retrieve files in hidden format.
- Learn the use of computer forensics tools used in data analysis.
- Learn how to find data that may be clear or hidden on a computer disk, find out the open ports for the attackers through network analysis, Registry analysis.

Text Books:

1. Real Digital Forensics for Handheld Devices, E. P. Dorothy, Auerback Publications.
2. The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics, J. Sammons, Syngress Publishing.

Reference Books:

1. Handbook of Digital Forensics and Investigation, E. Casey, Academic Press.
2. Malware Forensics Field Guide for Windows Systems: Digital Forensics Field Guides, C. H. Malin, E. Casey and J. M. Aquilina, Syngress.
3. The Best Damn Cybercrime and Digital Forensics Book Period, J. Wiles and A.Reyes, Syngress.

Laboratory – 4

RG 22 Regulations

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
Unit of USHODAYA EDUCATIONAL SOCIETY
An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956
3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137
Ph. No. 08622-212769, E-Mail: geethanjali@gist.edu.in, Website: www.gist.edu.in

PENETRATION TESTING AND CYBER OPERATIONS LABORATORY (Cyber Security)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A3709P	0:0:3:0	1.5	CIE:30 SEE:70	3 Hours	

Course Objectives:

The students will Able to learn:

- The different packet crafting techniques using different Networking tools.
- The different network Script programmes to measure the performance of Network.
- The understanding of different Protocols that measure the scope and lifetime of network.

Course Outcomes(CO):

On successful completion of this course, the student will be able to:

- Apply various Google and u se tools to gather information about the target specification.
- Identify appropriate tools to encrypt and decrypt passwords in network.
- Apply Nessus tool to identify vulnerability attacks and monitor the networking mechanism.
- Analyze the Crypt and OSINT tools to detailed network information of the target.
- Implement the SQL injection Atta cks to detect malware on the network.
- Apply Ettercap tool to scan the network and performing an ARP poisoning attack

Syllabus | **Total Hours:48 hrs**

LIST OF EXPERIMENTS:

Experiment **-1:** Use Google and Whois for Reconnaissance

Experiment **-2:** Use CryptTool to encrypt and decrypt passwords using RC4 algorithm.

- Use Cain and Abel for cracking Windows account password using Dictionary attack and to decode wirelessnetwork passwords

Experiment **-3:** Use TraceRoute, ping, ifconfig, netstat Command

Experiment **-4:** To perform ARP poisoning Experiment **-5:**

- Use Nmap scanner to perform port scanning of various forms – ACK, SYN, FIN, NULL, XMAS

Experiment **-6:** Use Wire Shark sniffer to capture network traffic and analyze. Experiment **-7:**

- Simulate persistent Cross Site Scripting attack. Experiment **-8:** Session impersonation using Firefox

Experiment **-9:**

- Session impersonation using Tamper Data add-on Experiment **-10:**
- Perform SQL injection attack. Experiment **-11:**
- Create a simple key logger using Python Experiment **-12:**
- Use Metasploit to exploit the data

Text Books: **1.**RafayBaloch, "Ethical Hacking and Penetration Testing Guide", CRC Press, 2015.
2.Dr.Patrick Engebretson, "The Basics of Hacking and Penetration Testing", Syngress Publications Elseveir, 2013.

Reference Books:

1.1afayBaloch, "EthicalHackingandPenetrationTestingGuide",CRCPress,2015,
2. Dr.Patrick Engebretson, "The Basics of Hacking and Penetration Testing", Syngress Publications Elseveir, 2013.
3. PrakharPrasad,"MasteringModern Web Penetration Testing",Packtet Publishing,2016.
4. Prakhar Prasad, "Mastering Modern Web Penetration Testing", Packt Publishing, 2016.
5. Gilberto Najera Gutierrez, "Kali Linux Web Penetration Testing", Cookbook, 2016.
6. Robert Svensson, "From Hacking to Report Writing: An Introduction to Security and Penetration Testing",2016.

Web References: https://www.youtube.com/watch?v=3Kq1MIfTWCE