PREAMBLE

The Learning Outcome-based Curriculum Framework (LOCF) approach has been adopted in B.Sc Information Technology Programme to create and disseminate knowledge to the students on the latest technologies by imparting the technical skills to meet industrial needs and inculcate the skills for employability at the point of graduation.

Vision

Empowering students with computing knowledge to stay in forefront of state-of-art technologies for rendering the need based services to the society.

Mission

- To impart quality based education by inculcating technical, entrepreneurship and leadership skills to meet global challenges.
- To enable the students acquire the skill of employability and entrepreneurship.

Programme Educational Objectives (PEOs):

PEO 1: To equip students with the fundamental concepts of Information Technology.

PEO 2: To help students in getting employment by mastering their skills.

PEO 3: To nurture creative thinking and make the students capable of undertaking innovative practices.

PEO 4: To develop environmental awareness, empowerment of humanity and civic consciousness.

PEO 5: To build the ability to cope with the changing environment

PEO 6: To mould them as responsible citizens by imparting value based education.

Program Outcomes (POs):

On successful completion of the B.Sc. Information Technology program, the graduates will be:

PO 1 Knowledge: Gain in-depth knowledge of software and hardware techniques

PO 2 Problem solving: Ability to critically analyze and provide software solutions for problems

PO 3 Environment and sustainability: Understand the impact of software solutions in environmental and societal context and strive for sustainable development.

PO 4 Team Work: Work in teams to accomplish the objective.

PO 5 Communication Skills: Able to communicate effectively.

Programme Specific Outcomes (PSOs):

PSO 1 Understand and analyze the fundamental knowledge in the Information Technology domain.

PSO 2 Enhance the logical and analytical thinking to understand the computational systems.

PSO 3 Ability to comprehend the development methodologies of software systems and to design the software solutions.

PSO 4 Explore the developing areas in the Information Technology sector and to enrich themselves to be skillful to meet the diverse expectations of the industry.

PSO 5 Equipped to be competent in providing optimal and ethical solutions to the technological challenges laid by the professional societies.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
B.Sc INFORMATION TECHNOLOGY
(with effect from the academic year 2021-2022)
SEMESTER WISE COURSE LIST

Sem	Course No	Course status	Course Title	Contact Hrs	Credits
I	1	Part I	Tamil / Other Languages	6	4
	2	Part II	English	6	4
	3	Core 1	Introduction to Information Technology & HTML	4	4
	4	Core Practical 1	Programming in HTML Lab	3	2
	5	Allied 1	Office Automation	3	3
	6	Allied Practical 1	Office Automation Lab	2	1
	7	Mandatory Core	Professional English I	4	4
	8	Part IV	Environmental Studies	2	2
			Sub Total	30	24
II	9	Part I	Tamil / Other Languages	6	4
	10	Part II	English	6	4
	11	Part III Core 2	C Programming	4	4
	12	Core Practical 2	C Programming Lab	3	2
	13	Allied 2	Digital Design	3	3
	14	Allied Practical 2	Linux Lab	2	1
	15	Mandatory Core	Professional English II	4	4
	16	Part IV	Value Based Education	2	2
			Sub Total	30	24
III	17	Part I	Tamil / Other Languages	6	4
	18	Part II	English	6	4
	19	Core 3	Object Oriented Programming with C++	4	4
	20	Core Practical 3	Object Oriented Programming with C++ Lab	3	2
	21	Allied 3	Data Structures	3	3
	22	Allied Practical 3	Data Structures Lab	3	2
	23	Skill Based Practical 1	Desk Top Publishing	3(1T + 2P)	2
	24	Non Major Elective 1	Software Fundamentals	2	2
	25	Common	Yoga*		2
			Sub Total	30	23

Sem	Course No	Course status	Course Title	Contact Hrs	Credits
IV	26	Part I	Tamil / Other Languages	6	4
	27	Part II	English	6	4
	28	Core 4	Java Programming	4	4
	29	Core Practical 4	Java Programming Lab	3	2
	30	Allied 4	Numerical Methods & Operations Research	3	3
	31	Allied Practical 4	Scripting Languages Lab	3	2
	32	Skill Based Practical 2	PHP & MySQL Lab	3(1T + 2P)	2
	33	Non Major Elective 2	Fundamentals of Internet	2	2
	34	Common	Computers for Digital Era*		2*
	35	Extension Activity	NSS/ NCC/ YRC/ YWF/ Sports		1
			Sub Total	30	24
V	36	Core 5	Software Engineering & Testing	4	4
	37	Core 6	Relational Data Base Management System	5	4
	38	Core 7	.NET Programming	4	4
	39	Core Practical 5	.NET Programming Lab	6	3
	40	Major Elective 1	Deep Learning / Data Warehousing and Data Mining / Cloud Computing/ Data Communication & Networking	4	4
	41	Mini Project		5	5
	42	Common Skill Based Elective	Personality Development/ Effective Communication/ Youth Leadership	2	2
			Sub Total	30	26
VI	43	Core 8	Operating System	5	4
	44	Core 9	Internet of Things	5	4
	45	Core 10	Python Programming	4	4
	46	Core Practical 6	Python Programming Lab	6	3
	47	Major Elective 2	Big Data Analytics/ Cyber Security / Mobile Computing/Computer Graphics	4	4
	48	Major Project		6	6
			Sub Total	30	25

Part I – Tamil / Other Languages

Part II - English

Part III – Core & Allied Papers, Major Electives, Mini Project, Major Project, Professional English (I & II), Skill based Papers

Part IV – Environmental Studies, Value Based Education, Common Skill Based Elective, Non Major Elective I & II, Yoga & Computer for Digital Era

Part V – Extension Activity

REGULATIONS/ PROGRAMME SPECIFIC REQUIREMENTS

Duration of the Course:

B.Sc. Information Technology is a 3 years full time programme spread over six semesters.

Eligibility for Admission to the Programme

Candidates who have passed any group in HSC are eligible for this programme (as specified in the admission guidelines given by the Directorate of Collegiate Education 2019-'20 - www.tndce.tn.gov.in/sites/default/files/2.Admission%20Guidelines_2019-20_Procedures.pdf)

Scheme of Evaluation: Core/ Elective/ Non-Major

Total Marks:100 (Internal:25 Marks, External:75Marks

There is no Passing Minimum for the CIA component. But overall(CIA + External),the student should get 40% or more to get a pass	
CIA-Internal Marks	**End Semester Examination– External Marks**
i. Average of best two tests from three: 20 Marks ii. Assignment: 05 Marks	Total: 75Marks
Total: 25Marks	Passing minimum 40% i.e. 30marks

PRACTICAL

Practical examinations will be conducted at the end of each semester. The scheme of valuation is to be decided by the respective board of Question setters.

Assessment Components (External: Internal–50:50)

Passing Minimum for Practical Examination:

There is no Passing Minimum for the CIA component. But overall (CIA + External), the student should get 40% or more to get a pass.

Passing Minimum for Mini/Major Project:

There is no Passing Minimum for the CIA component. But overall (CIA + External), the student should score 40% or more to get a pass.

PROJECT AND VIVA-VOCE

Project report evaluation and Viva-Voce will be conducted by the external examiner. The break-up for the project work is as follows:

Components	Marks
Project Report	20
Project Presentation & Viva-Voce	30
Total	50

External (End Semester) Examination Question pattern:

Time: 3 hours   Max. Marks: 75

Part– A   (10 x 1 = 10)

Answer all the questions

Ten Questions, two objective type questions from each unit.

Part–B   (5 x 5 = 25)

Answer all the questions

Five Questions, two short answer type questions from each unit with internal choice (Either ... Or ...type)

Part–C   (5 x 8 = 40)

Answer all the questions

Five Questions, two descriptive/Analytical type questions from each unit with internal choice (Either... Or ...type)

Model Question Paper

B.Sc.(CBCS) DEGREE EXAMINATION, NOVEMBER/ APRIL...........
First Semester
Information Technology/Computer and I.T.–Core
INTRODUCTION TO INFORMATION TECHNOLOGY AND HTML
(For those who joined in July 2021 onwards)

Time: Three hours   Maximum: 75 marks

PARTA—(10×1=10marks)
Answer ALL questions.

Choose the correct answer:

1.   Information Technology deals with ....

   (a)   Information   (b) data   (c) Knowledge   (d) cloud

2.   A comprehensive business process-driven methodology for information systems planning is   ....

   (a)   Application portfolio   (b) Information technology architecture
   (c)   Business systems planning   (d) Critical success factors

3.   Servers are computers providing resources to other computers connected to a   ....

   (a)   Client   (b) Mainframe (c) Supercomputer   (d)   Network

4.   A program that is used to view websites is called a ....

    (a)   Browser (b) Web viewer   (c) Spreadsheet   (d) Word processor

5.   Choose the correct HTML tag to make a text italic.

   (a)   <i>   (b) <italic>   (c)   <it>   (d) <il>

6.   What does the
 tag add to your webpage?

   (a)   Long break   (b) Paragraph break   (c) Line break   (d) Text break

7.   The first tag inside <TABLE> tag is ....
   (a)   <HEAD>   (b) <CAPTION>   (c) <TH>   (d) <TD>

8.   Which tag tells the browser where the page starts and stops?

   (a)   <html>(b) <body>(c) <head>(d)<title>

9.   CSS stands for ....

   (a)   Cascade style sheets   (b) Color and stylesheets

   (c)   Cascading style sheets   (d) Circle style sheets

10.   The property in CSS used to change the background color of an element is ....

   (a)   bgcolor   (b) background-color(c) color   (d) foreground-color

PARTB—(5x5=25marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Summarize the role of Information Technology.

Or

(b) What are the functions of Random Access Memory?Explain.

12. (a) Write down the role of ISP.
Or

(b) What is DNS? Explain.

13. (a) How are list types in webpages combined? Give example.
Or

(b) How is a HTML page created? Explain.

14. (a) Elaborate the various types of image formats and browsers.
Or

(b) How is a table created in HTML? Explain.

15. (a) What are selectors in CSS? Explain.
Or

(b) How is positioning done in CSS? Give example.

PARTC—(5x8=40marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) List out the various types of output devices and explain.
Or
(b) Elaborate the concept of memory hierarchy with neat diagram.

17. (a) What is an ISDN? What are its advantages? Explain the two types of ISDN.
Or

(b) Write HTML code to display your College address.

18. (a) How are links provided inside the same document? Explain.
Or
(b) Illustrate the steps to link to other HTML documents with example.

19. (a) Discuss the row span and column span in HTML.
Or
(b) What are the attributes of <frame> tag? Explain.

20. (a) How does Grid work in CSS?
Or
b) Illustrate the fonts and text effects in CSS

REGULATION 2021 - 22
I B.Sc. INFORMATION TECHNOLOGY

Sem	Sub No	Subject status	Subject Title	Contact Hrs	Credits
I	1	Part I	Tamil / Other Languages	6	4
	2	Part II	English	6	4
	3	Core 1	Introduction to Information Technology & HTML	4	4
	4	Core Practical 1	Programming in HTML Lab	3	2
	5	Allied 1	Office Automation	3	3
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	10	Part II	English	6	4
	11	Part III Core 2	C Programming	4	4
	12	Core Practical 2	C Programming Lab	3	2
	13	Allied 2	Digital Design	3	3
	14	Allied Practical 2	Linux Lab	2	1
	15	Mandatory Core	Professional English II	4	4
	16	Part IV	Value Based Education	2	2
			Sub Total	30	24

B.Sc. Information Technology) /Semester – I / Core 1

INTRODUCTION TO INFORMATION TECHNOLOGY AND HTML

L T P C

4 0 0 4

COURSE OBJECTIVE:

1. To understand the basic concepts and principles of Information Technology

2. To study the concepts of Internet

3. To learn different concepts of HTML

UNIT – I
Information Technology Basics: Introduction, Information, Technology, Information technology, Present Scenario, Role of Information Technology, Information technology, and internet, careers in IT industry – Computer Memory and Storage Introduction, memory hierarchy, Random Access Memory (RAM), Read Only memory (ROM).
Input Output Media *:* Introduction, types of input devices, type of output devices.

UNIT – II
Internet: Introduction – what is Internet – History of Internet – How the web works – Web server and clients – ISP, ISDN – Domain naming system – Internet - URL - protocol – server name – port – Relative URLs and Absolute URLs

UNIT – III
Hypertext: HTML – Basic components of HTML – Formatting the HTML text – linking to other HTML Documents – Linking inside the same document – Linking to other Internet Services
Lists in HTML: Ordered Lists – Using ordered lists – Unordered Lists – Directory Lists – Definition Lists –Combining list types

UNIT – IV
Graphics and Web pages: Image formats and Browsers – Graphics and HTML Documents – Images and Hyperlink anchors – Image Maps
HTML Tables: aligning table elements – row and column spanning – frames in HTML – Frameset container HTML Forms – The <input> tag – Scrolling Marquees

UNIT – V
Introduction of CSS : Syntax – Selectors - Display Positioning – Grid - Fonts and Text Effects - Colors,Gradient, Background Images - @keyframes - Transitions, Transforms and Animations

COURSE OUTCOME:

On successful completion of the course, the learners will be able to
   1. Identify input devices, output devices and memory of a computer
   2. Enhance the knowledge of the basic components of HTML
   3. Examine the usage of List, Table, Form and Frame concepts in HTML
   4. Create Transitions and Animations
   5. Design web pages

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	S	S	S	M	S	S	K - 3
CO 2	S	S	M	S	S	S	S	S	S	S	K - 2
CO 3	S	S	M	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Books:

1. Computer Fundamentals and Windows with Internet Technology – N.KRISHNAN.
2. Fundamentals of Information Technology - Alexis Leon and Mathews Leon, Vikas Publication.New Delhi

Reference Books:

1. Introduction to Computers, Peter Norton, Sixth edition, Mc-Graw Hill Companies.

2. HTML Introduction to Web Page Design and Development, David Mercer, Tata Mc-Graw HillPublishing Company Limited.

3. HTML & CSS :The Complete Reference, Thomas Powell

B.Sc. Information Technology) /Semester – I / Core Practical -1

PROGRAMMING IN HTML – LAB

L T P C

0 0 3 2

1. a. Write HTML code to develop a web page having the background in red and body "My First Page"in any other color.

b. Create a HTML document giving details of your name, age, telephone, address, roll no. using aligntag.

c. Write HTML code to design a page containing a text in a paragraph give suitable heading style.
d. Design a page having background color green, text color red and use all attributes of font tab.

2. a. Write HTML code to create a WebPage that contains an Image at its center.

b. Create a web Page using href tag having the attribute alink, vlink.

c. Write a HTML code to create a pink color web page and display moving message in red color.
3. a. Create a web page, showing an ordered list of names of your five friends.

b. Create a HTML document containing a nested list showing the content page of any book

c. Create a web page, showing an unordered list of name of fruits

4. Create a table in HTML with Dummy Data Name of Train Place Destination Train No Time Fare Arrival Departure

5. Write HTML code to create a web page that displays your class time table.

6. a. Create a web page with Table using Frame concept

b. Create a web page having two frames one containing links and another with contents of the links.When link is clicked appropriate contents should be displayed on Frame 2.

7. Design an application form using all input types

8. Design a website of your own by using all html tags.

9. Create students registration and login webpage using CSS

10. Create a mobile showroom advertisement using CSS

COURSE OUTCOME:

On successful completion of the course, the learners will be able to
1. Know and understand the tags of HTML
2. Work with CSS
3. Analyze the usage of List, Table, Form and Frame concepts in HTML
4. Create Transitions and Animations
5. Design and develop web pages

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	M	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K - 3
CO 3	S	S	M	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

OFFICE AUTOMATION

                                                    L T P C
                                                    3 0 0 3

COURSE OBJECTIVE:

1. To understand the various Microsoft office products

2. To study the concepts of Word, Excel, Access and PowerPoint

3. To learn different concepts of creating and accessing Microsoft office products

UNIT – I
Microsoft word: Word processor Basics – Opening Microsoft Word – Closing the Document and Quitting Word – Starting Microsoft Word XP - Introduction to word – Saving the Document – Previewing – Printing – Closing – Changing the size of a document.

Editing the Document: Opening an existing word document – Moving the cursor – Making changes in your document – Undoing any operation – Saving changes made to the Document– Checking Spelling in the Document – Automatic correction of errors – Printing the file – Saving and Closing the Document.

UNIT – II
Designing your Document: Creating a well formatted Document – Setting the Left , Right , Top and Bottom Margins – Setting page Numbers on your Document – Specifying text at the top and the Bottomof each page.

Creating Tables: Selecting Text using the mouse – Inserting Rows – Inserting Columns – Deleting a Row – Deleting a Column – Formatting the Text – Mail Merge.

UNIT – III

Microsoft Excel: Introduction to Spreadsheets – Use of Spreadsheet – Spreadsheet Basics – Formatting a Spreadsheet – Graphs – Functions of Microsoft Excel – Starting Microsoft Excel – Excel Work Environment – Changing size of a Work book and Excel Window – Cell and Cell Address – Standard Toolbar – Formatting toolbar – the Formula bar – Status bar – Components of an Excel Workbook.

Working in Excel: Entering data in cell address – Making changes to an entry – Mathematical Calculations – Formulas using numbers – Formula using Cell address – Defining functions simple Graphs.

UNIT – IV

Microsoft Access: Introduction to Databases – Defining a Database – Understanding RDBMS– objects of a Relational Database – Macros – Functions of a DBMS – Starting Microsoft Access – Creating Tables – Understanding Database – Creating database - Creating a Table – Working on Tables – Saving the Table – Defining primary Key – Closing the Table – Closing the Database window and Quitting Access.

UNIT – V

Microsoft PowerPoint: Starting PowerPoint – Creating a presentation – Saving a Presentation–working with views – Adding Graphics, Charts and Tables – Masters – Using Slide Transition-Printing –Closing the Slides – Quitting Microsoft PowerPoint.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand Word, Excel, Access and PowerPoint
2. Create and format a document
3. Examine the mathematical and statistical functions in Excel
4. Generate queries and reports with Access databases
5. Design efficient presentations in PowerPoint

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	S	M	S	S	K - 4
CO 2	S	S	S	S	S	S	S	S	S	S	K - 3
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	S	S	S	S	S	M	S	K - 5
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

OFFICE AUTOMATION

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book:

1. Vikas Gupta, Comdex Computer Course Kit (XP Edition), Dreametech press, New Delhi.

References:

1. Stephen L. Nelson, The Complete Reference Office 2000, Tata McGraw – Hill Publishing Companylimited, New Delhi.

2. N. Krishnan, Window and MS Office 2000 with Database Concepts, Scitech publications (India)Pvt Ltd., Chennai

	OFFICE AUTOMATION– LAB	**L T P C**
		0 0 2 1

MS – Word

1. Prepare a word document for spell checking and Thesaurus.
2. Prepare a document and apply Cut, Copy and Paste operations.
3. Find a word and Replace with another in a document.
4. Insert Header and Footer with the name of the Dept and Page No. in a document.
5. Insert a picture in your document.
6. Insert mathematical symbols using Microsoft equation 3.0.
7. Preparing Newspaper format (Apply Alignment, Font, Property, Line spacing, Picture Format).
8. Preparer a Bio-Data and insert the contents of qualification within the table.
9. Mail Merge
10. Macro.

MS – Excel

1. Apply formulas and functions
2. Prepare a chart for population growth.
3. Create a Pivot table.
4. Apply ascending and descending order
5. Apply auto format

MS – PowerPoint

1. Create a power point presentation with 3 slides.
2. Create a design template with 3 slides.
3. Create a presentation with animation.
4. Create a power point presentation with 4 slides. Set slide transition time of 3 seconds andDisplay your presentation.
5. Create a presentation with auto content wizard.

MS – Access

1. Create an employee database.
2. Create a student database. Set primary key.
3. Prepare salary list.
4. Create a report.
5. Create Mailing labels.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Create and format a document
2. Examine the mathematical and statistical functions in Excel
3. Sort data in Excel
4. Design efficient presentations in PowerPoint
5. Generate queries and reports using Access database

CO - PO - PSO Mapping

OFFICE AUTOMATION – LAB											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	S	S	S	S	S	S	K – 5
CO 2	S	S	S	S	S	S	S	S	S	S	K – 6
CO 3	S	S	M	S	S	S	S	M	S	S	K – 5
CO 4	S	S	S	S	M	S	S	S	S	S	K – 5
CO 5	S	S	M	S	S	S	S	S	S	S	K – 4

Strongly Correlated – S, Moderately Correlated – M, Weekly Correlated - L

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C PROGRAMMING   **L T P C**

</div>

COURSE OBJECTIVE: **4 0 0 4**

1. To understand the character set and different data types in C

2. To learn the different programming concepts in C

3. To analyze Pointers and Structures

4. To explore File Management using C

UNIT – I

Introduction – Character set – C Tokens – Keywords and Identifiers- Constants – Variables – Data Types – Declaration of Variables – Declaration of Storage class- assigning values to Variables – defining Symbolic Constants – Declaring Variable as Constant – Declaring Variables as Volatile – Overflow and Underflow of Data.

Operators and Expressions: Introduction – Arithmetic Operators - Relational Operators- Logical Operators – Assignment Operators – increment and decrement operators – Conditional Operators - Bitwise Operators - Special Operators - Arithmetic Expressions - Evaluation of Expressions – precedence of Arithmetic Operators – Type conversions in Expressions – Operator Precedence and Associativity – Mathematical Functions.

Managing Input and output Operations*:* Introduction - Reading a character - Writing a Character - Formatted Input - Formatted Output.

Unit II:

Decision Making and Branching*:* Introduction – Decision Making with IF statement – Simple IF Statement – The IF..Else Statement – Nesting of IF.Else Statements – The ELSE IF Ladder – The Switch statement – The? Operator –The GOTO Statement.

Decision Making and Looping: Introduction – the WHILE Statement – The DO Statement- The FOR Statement ¬Jumps in Loops – Concise Test Expressions.

UNIT III:

Arrays: Introduction – One Dimensional Arrays – Declaration of One Dimensional Arrays – Initialization of One Dimensional Arrays-Two Dimensional Arrays – Initializing Two Dimensional Arrays –Multi – Dimensional Arrays –Dynamic Arrays.

Character Arrays and Strings: Introduction – Declaring and Initializing string Variables – Reading strings from Terminal – Writing Strings to screen - Arithmetic Operations on Characters –putting strings to together- Comparison of Two strings – String Handling Functions –Table of strings.

UNIT IV:

User Defined Functions: Introduction – Need for User Defined Functions – a multi-Function Program – Elements of User Defined Functions –Definition of Functions – Return values and

their types – Function Calls – Function Declaration – Category of Functions – No Arguments and No Return Values – Arguments but No Return Values – Arguments with Return Values – No Arguments but returns a Value – Function that returns multiple values – Nesting of Functions – Recursion- Passing Arrays to Functions – Passing Strings to Functions – The Scope, Visibility and Lifetime of Variables

Structure and Unions: Introduction - Defining a Structure – Declaring Structure Variables- Accessing Structure Members – Structure Initialization Copying and Comparing Structure Variables- Operationson Individual Members – Arrays of Structures – Arrays within Structures – Structures with Structures – Structures and Functions – Unions – Size of Structures – Bit Fields.

UNIT V:

Pointers: Introduction – Understanding Pointers – accessing the Address of a Variable – Declaring Pointer Variables – Initialization of pointer variables – Accessing a variable through its pointer – chain of pointers Expressions – pointer increments and scale Factor – pointers and Arrays – Pointer and Character Strings – Array of pointers – pointers as Function Arguments – Functions Returning pointers –pointers to functions

File Management in C: Introduction – Defining and Operating a File – Closing a file – Input /output Operations on Files –Error handling During I/O Operations

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand the usage of Header files

2. Analyze the use of multi-dimensional arrays

3. Create user defined functions

4. Work with Union, Structures and Files

5. Become a good programmer in C

CO - PO - PSO Mapping

C PROGRAMMING											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 3
CO 2	S	S	M	S	S	S	S	S	S	S	K - 5
CO 3	S	S	S	M	S	S	S	S	M	S	K - 4
CO 4	S	S	S	S	S	S	S	S	S	S	K - 5
CO 5	S	S	S	M	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book:

Programming ANSI C 4E-E Balagurusamy, Tata McGraw – Hill Publishing company Limited.

Reference Books:

1. Schaum's outlines Programming with C- Byron s. Gottfried, Second Edition, Tata McGraw – Hillpublishing company Limited.

2. The complete Reference C – Herbert Schildt, Fourth Edition, Tata McGraw-Hill Publishing Companylimited.

3. Programming with ANSI and Turbo C- Ashok N. Kamthane, Pearson Educations.

C PROGRAMMING – LAB

L	T	P	C
0	0	3	2

1. Write a C program to check the given number is prime or not.

2. Write a program to calculate simple Interest and Compound Interest.

3. Write a C program to find the roots of a Quadratic Equation using simple if statement.

4. Write a C program to sort numbers in ascending order using for statement.

5. Write a C program to print Fibonacci Series using while statement.

6. Write a C program to find the value of 13+23+53+.........+253 using do... while
   Statement.

7. Write a C program to print the grade of a student using switch... case statement.

8. Write a C program for simple calculator using switch/case loop.

9. Write a C program to read in a three digit number (assuming that the inputin 539) and
   produce output as 5 hundreds 3 tens 9 units.

10. Write a C program for swapping two variables without using third variable.

11. Write a C program to prepare EB Bill using if...else if ladder.

12. Write a C program to find sum of Digits and reverse of the number using function.

13. Write a C program to find factorial and GCD value using recursion.

14. Write a C program to find the product of two Matrices.

15. Write a C program to arrange the names in alphabetical order using
    strcmp()function.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand the usage of Header files in C

2. Use Loop constructs to solve problems

3. Write programs with multi-dimensional Arrays

4. Appreciate the working of pointers

5. Handle strings

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	S	M	S	K - 3
CO 2	S	S	S	S	M	S	S	S	S	S	K - 5
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	S	S	M	S	S	S	S	S	K - 6
CO 5	S	S	S	S	S	S	S	S	M	S	K – 4

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

DIGITAL DESIGN

    L T P C

    3 0 0 3

COURSE OBJECTIVE:

1. To understand fundamental concepts of Number System

2. To impart knowledge about Gates and Boolean Algebra

3. To implement the Interrupt concept

Unit – I

Digital Systems and Binary Numbers: Digital Systems – Binary Numbers – Numbers – Base Conversions – octal and Hexadecimal Numbers – Complements – Signed Binary Numbers – Binary Codes – Binary Storage and Registers- Binary Logic.
Boolean Algebra: Introduction – Basic Definitions – Axiomatic Definition of Boolean algebra – Basic Theorems and properties of Boolean Algebra – Boolean Functions.

Unit – II

Logic Gates: Canonical and Standard Forms – other Logic Operations – Digital Logic Gates – integrated Circuits.
Gate – Level Minimization*:* Introduction – The Map Method –Four-Variable Map – Five -Variable Map – Product –of-Sums Simplification –Don't Care Conditions.
NAND and NOR Implementation – Exclusive OR Function.

Unit – III

Combinational Logic*:* Introduction – Combinational Circuits – Binary Adder – Subtractor – DecimalAdder – Binary Multiplier – Magnitude Comparator – Decoders – Encoders – Multiplexers
Synchronous Sequential Logic*:* Introduction – Sequential Circuits - Storage Elements - Latches –Storage Elements: Flip-Flops.

Unit – IV

Registers and Counters: Registers – shift Registers – Ripple Counters – Synchronous Counters
Memory: Introduction – Random Access Memory – Memory Decoding – Error Detection and Correction – Read Only Memory

Unit – V

Basic Computer Organization and Design: Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory-Reference Instructions – Input-Output and Interrupt – Complete Computer Description – Design of Basic Computer – Design of Accumulator Logic.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Comprehend Number Systems

2. Appreciate Boolean Algebra applications

3. Understand the usage of Adder and Subtractor in Digital Computers

4. Analyze Combinational Circuits

5. Understand various data transfer techniques

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	S	S	S	K – 4
CO 2	S	M	S	S	S	S	S	S	S	S	K – 5
CO 3	S	S	S	S	S	S	S	S	S	S	K – 3
CO 4	S	M	S	S	S	S	S	S	M	S	K – 5
CO 5	S	S	S	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

TEXT BOOKS:

1. M. Morris Mano, Michael D. Ciletti, Digital Design, Prentice Hall of India Private Ltd
2. M. Morris Mano, Computer System Architecture, Prentice-Hall of India Private Ltd.

REFERENCE BOOKS:

1. Albert Paul Malvino, Donald P.Leach, "Digital Principles and Applications", Tata McGraw –Hill Publishing Company Limited, New Delhi.
2. Donald D. Givone, Digital Principles and Design Tata McGraw–Hill Publishing Company Limited, New Delhi.
3. RP Jain, Modern Digital Electronics, Tata McGraw–Hill Publishing Company Limited, New Delhi
4. Andrew S. Tannenbaum, "Structured Computer Organization", Pearson India, 2016

B.Sc. Information Technology / Semester II - Allied –Practical 2

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LINUX – LAB

</div>

L T P C

0 0 3 2

1. Use any text editor in linux(say vi) to enter a C program to find the largest of three numbers, compileusing gcc and display the output.

2. Use any text editor in linux(say vi) to enter a C program to find the factorial of a given number,compile using gcc and display the output.

   3. Linux commands
         a. ls, mkdir, rmdir, cd, pwd, find, du(Directory oriented)
         b. cat, cp, rm, mv, wc (File oriented)
         c. ps, kill, batch, grep(Process oriented)
         d. write, mail, wall (Communication oriented

   4. Linux commands
         a. date, who, who am i, man, cal, echo, bc(General purpose)
         b. Pipe, Filter

   5. Write shell script to display date in the mm/dd/yy format, time, username and current directory.

   6. Write shell script to find the sum of digits of a given number.

   7. Write a program to generate Fibonacci series.

   8. Write a program to check whether given string is palindrome or not

   9. Write shell script to find factorial of a given integer.

   10. Write shell script to generate mark sheet of a student. Take 3 subjects, calculate and display totalmarks, percentage and Class obtained by the student.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Know the basics of Linux operating System

2. Understand the basic set of commands and editors in Linux operating system

3. Write shell scripts

4. Demonstrate the role of filters

5. Explores the use of operating system utilities

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	M	S	S	S	S	S	S	S	S	K - 2
CO 2	S	S	S	S	S	S	S	M	S	S	K - 6
CO 3	S	M	S	S	S	S	S	S	S	S	K - 3
CO 4	S	S	S	S	S	S	S	S	M	S	K - 5
CO 5	S	S	S	M	S	S	S	S	S	S	K – 5

LINUX – LAB

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Reference Books:

1. Linux: A practical approach, B. Mohamed Ibrahim, Firewall Media

2. Comdex Linux and Open Office course kit revised and upgraded, Gupta, Wiley India.

3. A practical guide to Linux command, editors, and shell programming 2/e; Mark G Sobell, PrenticeHall.

4. Linux Lab - Open source Technology : Ambavade – Dream Tech

II B.SC. INFORMATION TECHNOLOGY

Semester III

Sem	Sub No	Subject status	Subject Title	Contact Hrs	Credits
III	17	Part I	Tamil / Other Languages	6	4
	18	Part II	English	6	4
	19	Core 3	Object Oriented Programming with C++	4	4
	20	Core Practical 3	Object Oriented Programming with C++ Lab	3	2
	21	Allied 3	Data Structures	3	3
	22	Allied Practical 3	Data Structures Lab	3	2
	23	Skill Based Practical 1	Desk Top Publishing	(1T + 2P)	2
	24	Non Major Elective 1	Software Fundamentals	2	2
	25	Common	Yoga*		2*
			Sub Total	30	23

Semester IV

Sem	Sub No	Subject status	Subject Title	Contact Hrs	Credits
IV	26	Part I	Tamil / Other Languages	6	4
	27	Part II	English	6	4
	28	Core 4	Java Programming	4	4
	29	Core Practical 4	Java Programming Lab	3	2
	30	Allied 4	Numerical Methods & Operations Research	3	3
	31	Allied Practical 4	Scripting Languages Lab	3	2
	32	Skill Based Practical 2	PHP & MySQL Lab	3(1T + 2P)	2
	33	Non Major Elective 2	Fundamentals of Internet	2	2
	34	Common	Computers for Digital Era*		2
	35	Extension Activity	NSS/ NCC/ YRC/ YWF/ Sports		1
			Sub Total	30	24

COURSE OBJECTIVE:
1. To introduce the concept of object oriented programming
2. To instill programming skill with object oriented programming concept

Unit – I: Introduction to C++: Evolution of C++ - Object Oriented Technology – Disadvantage of Conventional Programming – Programming Paradigms — Key Concepts of Object Oriented Programming – Advantages of OOP – Object Oriented Languages.
Input and Output in C++: Streams in C++ - Pre-Defined Streams – Buffering – Stream Classes – Formatted and Unformatted Data – Unformatted Console I/O Operations – Typecasting with cout Statement – Member Functions of istream Class – Formatted Console I/O Operations.
C++ Declarations: Parts of C++ Program – Types of Tokens – Keywords – Identifiers – Dynamic Initialization – Data Types in C++ - Basic Data Type – Derived Data Type – User – Defined Data Type – The void Data Type – Type Modifiers – Wrapping Around – Typecasting – Constants – Constant Pointers – Operators - Precedence of Operators

Unit – II: Control Structures : Decision – Making Statements – The if-else Statements – The jump Statement – The goto Statement – The break Statement – The Continue Statement – The switch case statement – Loops – for Loop – Nested for Loops – while – do-while Loop. Functions in C++ : The main() Function – Parts of Function – Passing Arguments – L Values and R Values – Return by Reference – Default Arguments – Inline Functions – Function Overloading – Principles– Library Functions.

Unit – III: Classes and Objects: Classes in C++ Declaring Objects – The Public Keyword – The private Keyword – The protected keyword – Defining Member Functions – Data Hiding or Encapsulation – Classes, Objects and Memory – Static Member Variables and Functions – Static Object – Array of Objects – Objects as Functions Arguments – Friend Functions – Recursive Member Function – Local Classes – The main() as a Member Function – Overloading Member Functions – Overloading main() Function.
Constructor and Destructors : Characteristics of Constructors and Destructors – Applications with Constructors – Constructors with Arguments – Overloading Constructors – Constructor with Default Argument – Copy Constructors – The const Object – Destructors – Calling Constructor and Destructors – Qualifier and Nested Classes – Anonymous Objects – Recursive Constructor – Local vs Global Object

Unit – IV: Operator Overloading and Type Conversion : The Keyword Operator – Overloading Unary Operators – Operator Return Type – Constraint on Increment and Decrement Operators – Overloading Binary Operators – Type Conversion – Rules for Overloading Operators.
Inheritance : Access Specifiers and Simple Inheritance – Types of Inheritances – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes.
Pointers and Arrays : Pointer Declaration - Pointer to Class – Pointer to Object – The this Pointer – Base Classes – Arrays – Characteristics of Arrays – Arrays of Classes.

Unit – V: C++ and Memory: Memory Models – The New and delete Operators – Dynamic Objects. Binding, Polymorphism and Virtual Functions: Binding in C++ - Virtual

Functions – Rules for Virtual Functions – Pure Virtual Functions – Abstract Classes – Working with Virtual Functions.

Applications with Files : File Stream Classes – Steps of File Operations – Finding End of a File – File Opening Modes – File Pointer and Manipulators – Manipulators with Arguments – Sequential Read and Write Operations- Binary and ASCII Files – Random Access Operations.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Know basic concepts of Object Oriented Programming

2. Interpret the Benefits of Object Oriented Programming.

3. Make use of constructors and destructors

4. Interpret the Concepts of operator overloading

5. Understand Inheritance, Files and Templates

CO - PO - PSO Mapping

OBJECT ORIENTED PROGRAMMING WITH C++											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	M	S	S	S	S	S	K – 1
CO 2	S	S	S	S	S	S	S	S	S	S	K –4
CO 3	S	S	M	S	S	S	S	S	S	S	K –3
CO 4	S	S	M	S	S	S	S	S	S	S	K –2
CO 5	S	S	M	S	S	S	S	S	S	S	K – 2

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book :
1. Ashok N.Kamthane, Object Oriented Programming with ANSI and Turbo C++, Pearson Education, New Delhi.

Reference :
1. Herbert Schildt, C++ : The Complete Reference, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. E. Balagurusamy, Object Oriented Programming C++, Tata McGraw Hill Publishing Company Limited, New Delhi.
3. D. Ravichandran, Programming with C++, Tata McGraw Hill Publishing Company Limited, New Delhi.

	L T P C
OBJECT ORIENTED PROGRAMMING WITH C++ LAB	**0 0 3 2**

Program List

1. Write a C++ Program to show the difference between static and non-static member variables.
2. Write a C++ Program to access private data using non-member function. Use friend function.
3. Write a C++ Program to create a class MAT of size of m x n. Define the matrix operations addition, subtraction, input and output by overloading +, - , >> and << operators respectively.
4. Write a C++ Program to overload member function of class.
5. Write a C++ Program to invoke constructor and destructor.
6. Write a C++ Program that overloads + operator to perform Concatenation of two Strings
7. Write a C++ Program that overloads relational operators to perform Comparison of two Strings
8. Write a C++ Program to create multilevel inheritance. Create classes A1, A2 & A3.
9. Write a C++ Program to show hierarchical inheritance.
10. Write a C++ Program to declare an object and pointer to the class. Invoke member functions using pointer.
11. Write a C++ Program to create a class employee that contains two functions getdata() & putdata(). Create array of objects for the specified class and read the values using getdata(). Print the values using putdata().
12. Write a C++ Program using virtual function. Create a class vehicle that has a virtual function make(). Create another class two wheeler that is inherited from vehicle class which invokes the virtual function make(). Print the details of two wheeler. Create another class four wheeler which is also inherited from the two wheeler and invoke virtual function make(). Print details of the four wheeler.
13. Write a C++ function template for finding the minimum value in an array.
14. Write a C++ Program to perform read and write operations with objects using read() and write() functions.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Analyze the difference between the top-down and bottom-up approach

2. Understand the basic concepts of Object Oriented Programming

3. Interpret the Concepts of operator overloading

4. Comprehend function overloading

5. Appreciate the usage of Inheritance

CO - PO - PSO Mapping

OBJECT ORIENTED PROGRAMMING WITH C++ LAB											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	M	S	M	S	K - 4
CO 2	S	S	M	M	M	S	S	S	S	S	K - 2
CO 3	S	S	M	M	M	S	S	S	S	S	K - 2
CO 4	S	S	S	S	M	S	S	S	S	S	K - 1
CO 5	S	S	S	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

DATA STRUCTURES

L T P C

3 0 0 3

COURSE OBJECTIVE:

1. To introduce the concept of Data Structures and its applications

2. To develop algorithm writing skills

Unit – I

Introduction and Overview : Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures. 1 D Array – Memory allocation of an Array – Operation on Arrays – Application of Arrays – Multidimensional Arrays – 2 D Array – Sparse Matrices – 3 D and n – dimensional arrays – Pointer Arrays.

Unit – II

Linked Lists : Definition – Single Linked List – Representation of a Linked List in memory – Operations on a Single Linked List – Circular Linked List — Operations on a Double Linked List — Operations on Circular Double Linked List – Applications of Linked List – Sparse Matrix Manipulation – Polynomial Representation – Dynamic Storage Management – Memory Representation – Fixed Block Variable Block Storage.

Unit – III

Stacks : Definitions – Representation– Array Representation of Stacks – Linked List Representation of Stacks – Operations on Stacks – Application of Stacks – Evaluation of Arithmetic Expressions – Implementation of Recursion – Factorial Calculation Queue : Definition – Representation of Queues – Representation of Queues using an Array – Representation of a Queue using a Linked List – Various Queue Structures – Circular Queue – Dequeue – Priority Queue.

Unit – IV

Tables : Hash Tables – Hashing Techniques – Collision Resolution Techniques – Closed Hashing – Open Hashing - Comparison of Collision Resolution Techniques. Representation of Binary Tree – Linear Representation of Binary Tree- Linked Representation of Binary Tree – Physical Implementation of a Binary Tree in Memory – Operation on a Binary of Binary Tree – Physical Implementation of a Binary Tree in Memory – Operation on a Binary Tree – Insertion – Deletion – Traversals – Merging together Two Binary Trees – Types of Binary Trees – Expression Tree – Binary Search Tree – Heap Tree – Threaded Binary Tree.

Unit – V

Sorting Techniques – Straight Insertion Sort – Straight Selection Sort – Heap Sort – Bubble Sort – Shell Sort – Quick Sort – Merge Sort. Searching – Linear Search

Techniques – Linear Search with Array – Linear Search with Linked List – Linear Search with Ordered List – Binary Search.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand the concept of data types

2. Recognize the use of basic data structures such as arrays and linked lists

3. Choose appropriate data structures for real time problems

4. Explore the usage of hash tables

5. Analyze the different sorting and searching algorithms

CO - PO - PSO Mapping

DATA STRUCTURES											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	M	S	M	S	S	S	K - 2
CO 2	S	S	S	M	M	S	S	M	S	S	K - 1
CO 3	S	S	S	S	S	S	S	S	M	S	K - 3
CO 4	S	S	S	S	S	S	S	S	S	M	K - 4
CO 5	S	S	S	S	S	S	S	S	S	S	K – 4

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book :

1. "Classic Data Structures" Debasis Samanta, PHI Learning Limited, New Delhi, 2009 Second Edition.

DATA STRUCUTRES LAB

	L T P C
	0 0 3 2

Program List

1. Search an element in an array using Binary Search.

2. Stack Implementation using Array.

3. Queue implementation using Array.

4. To manipulate a linked list.

5. Infix to postfix expression.

6. Evaluation of Postfix expression

7. Binary Tree Traversal

8. Merge Sort

9. Selection Sort

10. Quick Sort

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Gain knowledge about the concepts of data structures
2. Perform operations on the data structures
3. Convert infix to postfix expression
4. Evaluate Postfix expressions
5. Analyze different scorching algorithms

CO - PO - PSO Mapping

DATA STRUCUTRES LAB											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	M	S	S	S	S	S	K – 1
CO 2	S	S	S	S	S	S	M	S	S	S	K – 3
CO 3	S	S	M	S	S	S	S	S	M	S	K – 3
CO 4	S	S	M	S	S	S	S	S	S	S	K – 5
CO 5	S	S	S	S	S	S	M	S	S	S	K – 4

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

SEMESTER – III/ Skill Based Practical 1

<div align="center">

DESK TOP PUBLISHING

</div>

L T P C

0 1 2 2

Do the following in **Page Maker**

1. Design ID Card (3" * 2").
2. Design Visiting Card (3.5" * 2").
3. Design an attractive invitation Card (5.5" * 8").
4. Design Letter Pad. (7.5" * 9").
5. Preparation of a small booklet with 6 pages (3.5" * 4.5").
6. Design a hand bill (5.5" * 8.5").
7. Create an advertisement for your college.
8. Design your college progress card.
9. Create a receipt bill with counter foil.
10. Create a graph/pie chart.
11. Create an advertisement for a mobile shop (with offers)
12. Design a Greeting Card
13. Design Aadhar Card
14. Design Workshop brochure
15. Design a feedback form

COURSE OUTCOME:

On successful completion of the course, the learners will be able to
1. Understand the basic principles of PageMaker
2. Design Greeting cards
3. Create advertisements
4. Create better layouts using grids and guides
5. Prepare Booklet

<div align="center">

CO - PO - PSO Mapping

</div>

		DESK TOP PUBLISHING									
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	M	S	S	M	S	S	K – 2
CO 2	S	S	M	S	S	S	S	S	S	S	K – 6
CO 3	S	S	M	S	S	S	S	S	S	S	K – 6
CO 4	S	S	M	S	S	S	S	S	S	S	K – 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

<div align="center">

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

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SOFTWARE FUNDAMENTALS

L T P C

2 0 0 2

COURSE OBJECTIVE:

1. To introduce the fundamentals of computer software
2. To understand the difference between hardware and software
3. To get an idea of Windows Operating System

Unit-I: Computer Program: Introduction – Developing a program – Algorithm – Flowchart – Decision Tables.

Unit-II: Program Testing and Debugging – Program Documentation – Program Paradigms: Unstructured programming, Structured programming and Object Oriented Programming – Characteristics of Good Programming.

Unit-III: Computer Languages: Evolution Programming Languages – Classification of Programming Languages – Generation of Programming Languages – Features of Good Programming language.

Unit-IV: Computer Software: Software Definition – Relationship between Software and Hardware - Software Categories : System Software and Application Software – Terminology Software Firmware, Liveware, Freeware, Public Domain Software, Shareware, Commercial Software and Proprietary Software.

Unit V: WINDOWS:GUI, Desktop and its elements, Anatomy of a window – Title Bar, Minimize, Maximize, Restore and Close Buttons, Scroll Bars, Menus and Tool - Starting and shutting down of windows.
WINDOWS Explorer, working with organization of files and folders, Copy, Move and Print files – setting time and date

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Gain knowledge on the basic concepts of Software
2. Differentiate the different program paradigms
3. Understand the graphical user interface of Windows Operating System
4. Organize Files and Folders in Windows Explorer
5. Set Date and Time in a Computer

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	M	S	S	K – 2
CO 2	S	S	S	S	S	S	S	S	S	S	K – 4
CO 3	S	S	M	S	S	S	S	S	S	S	K – 2
CO 4	S	S	M	S	S	S	M	M	M	M	K – 3
CO 5	S	S	M	M	M	S	S	M	M	M	K – 3

SOFTWARE FUNDAMENTALS

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book:

Introduction to Computer Science, ITL Education Solutions Limited, 2/e, Pearson

https://edu.gcfglobal.org/en/windowsbasics/navigating-windows/1/

Reference Books:

1. Fundamentals of Computers, V.Rajaram, 5th Edition, PHI

2. Introduction to Computers, Peter Norton, 7/e, TMH.

JAVA PROGRAMMING

L	T	P	C
4	0	0	4

COURSE OBJECTIVE:

1. To impart fundamentals of object-oriented programming in Java
2. To inculcate concepts of inheritance
3. To familiarize the concepts of packages and interfaces.
4. To demonstrate the concept of event handling used in GUI.

Unit – I

The Genesis of Java : Overview of Java – Development of Java – JDE – Data Types – Variables – Arrays – Type Conversion and Casting – Operators – Precedence – Control Statements.

Unit – II

Introduction Classes : Objects – OOPs Concepts – Declaring Objects – Introducing Methods – Constructors – Overloading – this keyword – Garbage Collection – finalize () method – More Examples. Objects as parameters – returning objects – recursion – Access Control – Static – Final – Nested and Inner Classes – Command Line Arguments – Sample Programs.

Unit – III

String and String Buffer Class Inheritance : Types of Inheritance – Method Overriding – Dynamic method Dispatch – Abstract Class – Final with Inheritance – More Examples. Packages – Access Protection – Importing Packages – Interfaces – Implement and Applying Interfaces – Sample Programs.

Unit – IV

Exception Handling: Exception Types – Our Own Exception – Handling Exception – Java‟s Built in Exception – Thread Class and Runnable Interface – Extending Thread – Creating Multiple Threads – isAlive () and join() methods – Synchronization – suspend (), resume () and stop() threads – Example Programs. I/O packages – Input Stream – Output Stream – File Input and Output Stream – Applet Class – An Applet Skeleton – Simple Applet Display Methods – Example Programs.

Unit – V

Event Handling : Delegation Event Model – Event Classes – Sources of Events – Event Listener Interface – AWT Controls – Labels – Buttons – Check Boxes – Check Box Group – Lists – Scroll Bar – Text Area – Menu Bars and Menu – Layout Managers

COURSE OUTCOME:

On successful completion of the course the learners will be able to:

1. Analyze the necessity for Object Oriented Programming paradigm
2. Design an object oriented system with AWT components
3. Choose multithreaded processes as per needs and specifications.
4. Create Applets to handle events
5. Understand Exception Handling

CO - PO - PSO Mapping

JAVA PROGRAMMING											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	M	S	S	M	S	M	K - 4
CO 2	S	S	S	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 5
CO 4	S	S	S	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 2

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book :

1. Herbert Schildt, "Java 2" Fourth Edition, Tata McGraw – Hill Publishing Company Ltd, New Delhi.

Reference :

1. Peter Norton and William Stanek, Guide to Java Programming, Techmedia, New Delhi.

2. Martin RineHart, Java Database Development, Ed – 1998, Tata McGraw – Hill Publishing Company Ltd, New Delhi.

L T   P   C

0   0   4   2

JAVA PROGRAMMING LAB

1. Create a Simple program with your own detail.

2. Use Overload i) Method ii) Constructor

3. Create a Program for object as parameters and returning objects.

4. Create a program with abstract class.

5. Create a program using Multilevel Inheritance.

6. Develop a Program using Interface.

7. Create and Import Package (Minimum Three Classes)

8. Create your Own Exception for Employees.

(Constraints 1.Age > 18 and < 58 2.Dept No. 10 || 20 || 30 || 40)

9. Suspend, Resume and Stop Threads (Minimum 3 Threads)

10. Read and Write the content of a file using I/O Packages.

11. Display a Simple Banner Applet.

12. Event Handling Mechanism for Keyboard and Mouse.

13. Create a Login form.

14. Simple Web Presentation using HTML Tag (Use 3 Pages)

15. Create a Program for Moving Ball (Start and Stop)

16. Create a Simple Java Database with 4 fields.

COURSE OUTCOME:

On successful completion of the course the learners will be able to:

1. Analyze the necessity for Object Oriented Programming paradigm
2. Design an object oriented system with AWT components

3. Understand Inheritance
4. Create Applets that Handle events
5. Analyze multi threads

CO - PO - PSO Mapping

JAVA PROGRAMMING LAB											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	M	S	M	M	S	M	K - 4
CO 2	S	S	S	S	S	S	M	S	S	S	K - 6
CO 3	S	S	M	S	S	S	S	S	S	S	K - 2
CO 4	S	S	S	S	S	S	M	S	S	S	K - 6
CO 5	S	S	S	M	M	S	S	S	S	S	K – 4

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

NUMERICAL METHODS AND OPERATIONS RESEARCH

L T   P   C

3 0   0   3

COURSE OBJECTIVE:

1. To introduce the concept of solving equations using different methods

2. To understand the use of Assignment and Transportation problems

UNIT 1

Solution of Algebraic and Transcendental Equations**:** Introduction - Basic properties of equations - Bisection method - Regula Falsi method - Secant method - Iteration method - Newton Raphson method

UNIT II

Solution Of Simultaneous Algebraic Equations: Solution of linear simultaneous equations - Direct methods of solution - Gauss elimination method, Gauss - Jordan method, Gauss Jacobi Method - Gauss Seidal Method

UNIT III

Numerical Integration: Trapezoidal rule, Simpson's one - third rule - Simpson's three - eighth rule

UNIT IV

Assignment Problem: Mathematical formulation – Hungarian method – Unbalanced assignment problem – various types.

UNIT V

Transportation Model: Methods for finding Initial Basic Feasible Solution– North West Corner Rule – Least Cost Method – Vogel approximation Method - Degeneracy in Transportation problems – Unbalanced Transportation problem.

COURSE OUTCOME

On successful completion of the course, the learners will be able to

1. Obtain numerical solution of nonlinear equations

2. Solve system of linear equations using direct and iterative methods

3. Apply various optimization techniques for decision making

4. Able to identify, formulate, and solve complex real world problems

5. Determine the optimal solution for Assignment and Transportation problems

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	M	S	S	S	S	S	K – 5
CO 2	S	S	S	S	S	S	S	S	M	S	K – 3
CO 3	S	S	S	S	S	S	S	S	M	S	K – 3
CO 4	S	S	M	S	S	S	S	S	S	S	K – 5
CO 5	S	S	S	S	S	S	S	S	S	S	K – 3

The table title spans: NUMERICAL METHODS AND OPERATIONS RESEARCH

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

TEXT BOOKS

1. B.S. Grewal, "Numerical Methods in Engineering & Science", Khanna Publishers, Fifth Edition, April 1999.

2. S.D. Sharma, "Operations Research", Kedamath Ramnath & Co. Meerut.

B.Sc. Information Technology / Semester IV / Allied Practical 4

SCRIPTING LANGUAGE LAB

L T P C

0 0 3 2

1. Write script to show alert message

2. Write script to add 10 each time you click sum button.

3. Write script to display today's date and time.

4. Write script to display week name when week number is entered.

5. Write script to change string to uppercase letters.

6. Write script to display random numbers in a given range.

7. Write script to get sum of natural numbers in a given range.

8. Write script to validate a form.

9. Write script to print a message after delay of 10 seconds.

10. Write script using for each loop to increment numbers of integer array by 5

11. Write script to enter positive numbers in an array and generate an exception if negative numbers are entered.

12. Write script to calculate number of days between two dates

13. Write script to change text color when button is clicked.

14. Develop an auto refreshing digital clock using Javascript.

15. Develop Javascript application to display the visitors page count.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Comprehend the differences between typical scripting languages
2. Compare typical system and application programming languages
3. Acquire programming skills in scripting language
4. Differentiate VB Script, JavaScript and TypeScript
5. Add script in HTML Documents

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	M	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K – 4
CO 3	S	S	M	M	M	S	S	S	S	S	K - 1
CO 4	S	S	S	M	S	S	S	S	S	S	K - 2
CO 5	S	S	S	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

B.Sc. Information Technology / Semester IV / Skill Based Practical 2

PHP and MySQL LAB

L	T	P	C
0	1	2	2

COURSE OBJECTIVE:

1. To introduce the concept of PHP and to give basic Knowledge of PHP.

2. To understand basic concepts of database

3. Understand how to use MySQL with programming languages like PHP.

Program List:

1. Create a simple HTML form and accept the user name and display the name through PHP echo statement.

2. Write PHP script to redirect a user to a different page.

3. Write PHP function to test whether a number is greater than 30, 20 or 10 using ternary operator

4. Create PHP script which displays the capital and country name from the given array. Sort the list by the name of the country

5. Write PHP script to calculate and display average temperature, lowest and highest temperatures of five countries

6. Create PHP script using for loop to find the sum of integers from 1 to 50.

7. Write PHP script using nested for loop that creates a chess board.

8. Write PHP function that checks if a string is all lower case.

9. Write PHP script to calculate the difference between two dates.

10. Write PHP script to display time in a specified time zone

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Develop web content with PHP

2. Write code for any application

3. Understand the basic concepts of database

4. Work with relational databases and MySQL

5. Analyze the use of open source software

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	S	S	S	S	K – 6
CO 2	S	S	S	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	M	M	S	S	S	S	S	K - 2
CO 4	S	S	S	S	S	S	S	S	S	S	K - 5
CO 5	S	S	S	S	S	S	S	S	S	S	K – 4

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

REFERENCE:

1. Michele E Davis, Jon A. Phillips, Learning PHP and MySQL, O'Reilly Media Inc, 2006

2. Larry Ullman, PHP and MySQL for Dynamic Websites

3. Frank M.Kromann, Beginning PHP and MySQL: From Novice to Professional, 5th Edition, APress

Other than B.Sc. (CS), B.Sc. (IT), B.Sc. (C & IT) and BCA

L T P C

FUNDAMENTALS OF INTERNET

2 0 0 2

COURSE OBJECTIVE:

Understand the basics of Internet and Web Services.

Unit I

The Internet: Introduction – From Computers to the Internet - Advantages of the Internet – Major Internet Services – Hardware and Software in the Internet Age. Evolution and Growth of the Internet: Birth of the Internet – Current Networking Technologies – Next Generation Networking. Working of the Internet: The Internet Architecture – Client Server Computing – TCP/IP - The Protocols of the Internet.

Unit II

Getting Online: Types of Internet Accounts – Selecting Internet Service Providers – Electronic Mail: Advantages of E-mails – E-mail addresses – Mail transfer protocols – Working of E-mail system. World Wide Web: Architecture of the World Wide Web – Types of websites – Uniform Resource Locator – Domain Name System – Web Pages and Web Links – Visiting Web Pages – Using Internet Explorer – Searching the Web – Google and Yahoo Search Engines.

Unit III

Hosting and Promoting Websites: Structure of Websites – Web Development tools – Microsoft Front Page –Adobe Dreamweaver – Visual Studio. NET – Hosting Websites – Getting a Domain /name – Visitor Analysis and Statistics – Website Promoting methods.

Unit IV

Electronic Commerce: E-Business and E-Commerce – Types of business in the internet – M-Commerce - Marketing Strategies on the Web – Making Payments in Virtual Stores – Shopping in Virtual Stores –Cookies and E-Commerce – Major issues of E-commerce and M-Commerce – Future of E-commerce.

Unit V

Blogs and Social Networking: Blogs – Uses of Blogs – Blogs System Components – Steps for Blogging – Building a Blog site – Social Networking – Etiquette in networking sites. Internet Security: Importance of Internet Security – Internet Threats – Identity theft and Cybersquatting – Hacking – Spamming and Spoofing – Phishing and Pharming – Denial of Service – spyware – Viruses and worms- Security solutions – Firewalls and Intrusion Prevention Systems –Internet Security Precautions- The Information Technology Act.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Browse efficiently
2. Host websites
3. Efficiently perform e-transactions
4. Create Blogs
5. Analyze the use of Antivirus software and Firewalls

CO - PO - PSO Mapping

FUNDAMENTALS OF INTERNET											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	M	M	S	S	S	M	M	S	K – 3
CO 2	S	S	S	S	S	S	S	M	S	S	K - 6
CO 3	S	S	M	S	M	S	M	S	M	S	K - 3
CO 4	S	S	M	S	S	S	S	S	S	S	K - 6
CO 5	S	S	S	S	S	S	S	M	S	S	K – 4

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book:

The Internet: A User's Guide Second Edition K.L. James – PHI Learning Private Limited

Reference Books:

1. Internet, World Wide Web, How to program, 4th Edition, Paul Deital, Harvey M Deitel, Pearson

2. Learning Internet & Email, 4th Revised Rdition, Ramesh Bangia, Khanna Book Publishing Co Pvt Ltd.

3. Internet & Ecommerce, C. Nellai Kannan, NELS Publications.

III B.SC. INFORMATION TECHNOLOGY
Semester V

Sem	Sub No	Subject status	Subject Title	Contact Hrs	Credits
V	36	Core 5	Software Engineering & Testing	4	4
	37	Core 6	Relational Data Base Management System	5	4
	38	Core 7	.NET Programming	4	4
	39	Core Practical 5	.NET Programming Lab	6	3
	40	Major Elective 1	Deep Learning / Data Warehousing and Data Mining / Cloud Computing/ Data Communication & Networking	4	4
	41	Mini Project		5	5
	42	Common Skill Based Elective	Personality Development/ Effective Communication/ Youth Leadership	2	2
			Sub Total	30	26

Semester VI

Sem	Sub No	Subject status	Subject Title	Contact Hrs	Credits
VI	43	Core 8	Operating System	5	4
	44	Core 9	Internet of Things	4	4
	45	Core 10	Python Programming	5	4
	46	Core Practical 6	Python Programming Lab	6	3
	47	Major Elective 2	Big Data Analytics/ Cyber Security / Mobile Computing/ Computer Graphics	4	4
	48	Major Project		6	5
			Sub Total	30	25

Software Engineering and Testing

L T P C
4 0 0 4

COURSE OBJECTIVE:

1. To impart knowledge on software engineering process
2. To understand software design concept, rules for designing UIs
3. To acquire knowledge of the basic concepts of software testing, testing tools and integration tools.

UNIT I

SOFTWARE ENGINEERING: The Nature of Software – The Changing Nature of Software – Software Engineering – Defining the Discipline – The Software Process – Software Engineering Practice – Software Development Myths – Software Process Structure – A Generic Process Model – Defining a Framework Activity – Identifying a Task Set.

Process Patterns – Process Assessment and Improvement – Process Models – Prescriptive Process Models – Specialized Process Models – The Unified Process – Personal and Team Process Models – Process Technology – Product and Process – Agile Development – Agility and the Cost of Change – Extreme Programming – Other Agile Process Models.

UNIT II

MODELING: Requirements Engineering – Establishing the Groundwork – Eliciting Requirements – Developing Use Cases – Building the Analysis Model – Negotiating Requirements – Requirements Monitoring – Validating Requirements.

Avoiding Common Mistakes – Requirements Modelling: Scenario – Based Methods – Requirements Analysis – Scenario-Based Modelling – UML Models That Supplement the Use Case.

UNIT III

DESIGN CONCEPTS: The Design Process – Design Concepts – The Design Model – Architectural Design – Software Architecture – Architectural Styles – Architectural Design – Agility and Architecture – Component Level Design – Designing Class–Based Components – Conducting Component Level Design – Component Level Design for WebApps – Component-Level Design for Mobile Apps.

Designing Traditional Components – Component-Based Development – User Interface Design – The Golden Rules – User Interface Analysis and Design – Interface Analysis – Interface Design Steps – WebApp and Mobile Interface Design – Design Evaluation.

UNIT IV

SOFTWARE TESTING: AN OVERVIEW: Introduction – Software Testing – The Three Step Process to Become a World-Class Testing Organization – Software Testing Guidelines – Software Testing Tools – Selecting and Installing Software Testing Tools – Integrating Tools into the Tester's Work Process – Selecting and Using Test Tools – Training Testers in Tool Usage.

UNIT V

VERIFICATION AND VALIDATION TESTING: The Seven-step Testing Process – Overview of the Software Testing Process – Verification Testing – Validation Testing – Rapid Application Development Testing – Testing a Multiplatform Environment.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand Software Process models
2. Analyze Software Engineering Practices
3. Agile development.
4. Develop Software
5. Apply appropriate Software testing strategies

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	M	S	S	K - 2
CO 2	S	S	S	S	S	S	S	S	S	S	K - 6
CO 3	S	S	M	S	S	S	S	S	S	S	K - 4
CO 4	S	S	S	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Software Engineering and Testing (table title)

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

TEXT BOOKS

1. Roger S. Pressman, Software Engineering: A Practitioner Approach, Eighth Edition, McGraw Hill, 2015.

2. William E. Perry, Effective Methods for Software Testing, Third Edition, John Wiley, 2015

REFERENCE BOOKS

1. Somerville, Software Engineering, Tenth Edition, Pearson Edition, 2018.

2. Ali Behforroz, Frederick J.Hudson, Software Engineering Fundamentals, Oxford Indian Reprint, 2012.

3. Yogesh Singh, Software Testing, First Edition, Cambridge University Press, 2012.

4. Glenford J. Myres, Tom Badgett, Corey Sandler, The Art of Software Testing, Third Edition, Pearson Education, 2011.

RELATIONAL DATA BASE MANAGEMENT SYSTEM

L T P C
4 1 0 4

COURSE OBJECTIVE:

1. To introduce relational algebra and Normalization

2. To explain the basic concepts of relational data model, entity-relationship model, relational database design and SQL.

3. To organize, maintain and retrieve information effectively from a DBMS.

Unit - I

Introduction : Purpose of Database Systems – Data Models – Database Languages – Transaction Management – Storage Management – DBA – Database Users – System Structure. E-R Model – Entities and Entity sets – Relationship Sets – Mapping Constraints – E-R Diagram.

Unit – II

Structure of Relational Databases *:* Relational Algebra – Tuple Relational Calculus – Domain Relational Calculus – Integrity Constraints – Normalization – Boyce – Codd Normal Form – Third Normal Form – Fourth Normal Form – Domain – Key Normal Form.

Unit – III

Basic SQL Operations : Creating a Table – Insert – Rollback – Commit – Auto commit – Delete – Update – Select, From, Where and Order by – Single value tests – Single value tests – LIKE – Simple tests against a list of values – Combining Logic – Dropping tables – Dropping a Column – Creating a table from a table – Data Functions – Conversation functions – Translate – Decode – Creating a view – Advanced Sub queries – Outer Joins – Natural and Inner Joins – Union, Intersect & Minus – Synonyms – Indexes – Tables space – Clusters – Sequences.

Unit – IV

Basics of Object : Relational Databases : Objects – Abstract Data Types – Nested tables – Varying arrays – Large Objects – References Object Views – Naming conventions for objects – structure of an object – Users, Roles and Privilege : Creating a user – Password management – Three Standard roles – Format for grant command – Revoking privileges – What users can Grant : Moving to another user – Create Synonym – Create a role – Granting privileges to a role – Granting a role to another role – Adding Password to a role – Removing password from a role – Enabling & Disabling Roles – Revoking Privilege from a role – Drop role.

Unit – V

An Introduction to PL/SQL : PL/SQL Overview – Declaration section – Executable commands section – Exception handling Section – Triggers : Syntax – Types of Triggers : Row – Level – Statement – Level – before & after – Instead of Schema – Database – Level Triggers – Enabling & Disabling Triggers – Replacing & Dropping Triggers – Procedures, Functions & Packages : Syntax – Compile – Replace – Drop Procedure, Functions & Packages – Cursor Management.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Describe the fundamental elements of relational database management systems
2. Convert the ER-model to relational tables
3. Formulate SQL queries on data.
4. Improve the database design by normalization
5. Work with PL/SQL

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 2
CO 2	S	S	S	S	M	S	S	S	S	S	K - 6
CO 3	S	S	S	S	M	S	S	S	S	S	K - 4
CO 4	S	S	M	S	S	S	M	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

(RELATIONAL DATA BASE MANAGEMENT SYSTEM)

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Books:

1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan "Database System Concepts" McGraw – Hill Education, 2010.

2. Kevin Loney, George Koch And the Experts at TUSC, "ORACLE 9i The Complete Reference", Tata McGraw – Hill Publishing Company Ltd., New Delhi.

3. Database Systems RamezElmasri, Shankant B. Navathe – 6th Edition – Pearson.

Reference :

1. Rajesh Narang – "Database Management Systems", PHI Learing Pvt. Ltd., 2006.

2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw – Hill Education, 2002.

3. Michael Abbay, Mike Corey, Ian Abramson, "ORACLE 9i A Biginner"s Guide", TataMcGraw – Hill Publishing Company Ltd., New Delhi, 2002.

4. The Database Application Book using the MYSQL Database Gehani – Universities Press.

B.Sc. Information Technology / Semester V / Core 7

.NET PROGRAMMING	**L T P C**		

COURSE OBJECTIVE:

4 0 0 4

1. To introduce .NET framework.

2. Design and develop professional console and window based .NET application using Web Form Controls.

3. Design and Implement database connectivity using ADO.NET in window based application.

Unit – I

The .NET Frame Work : Learning the .NET Languages – Introduction to ASP.NET and IIS – Types, Objects and Name Spaces – ASP .NET Application – Building ASP.NET Website.

Unit – II

Web Form Fundamentals : HTML Controls – Web Controls – Validation Controls – Navigation Controls – Data Controls – Login Controls – CSS – Working with CSS in Web Developer – More Programs.

Unit - III

State Management : Session – View – Query String – Cookies – Tracing – Logging – Error Handling – User Controls – ASP.NET Ajax – Example Programs.

Unit – IV

ADO.NET : Over View of ADO.NET – ADO.NET Access – Data Binding – Data List – DATA Grid and Repeaters – Working with Data base – Sample Programs.

Unit – V

XML : Using XML – XSD – XSLT – Web Services – Creating Web Services – Using Web Services – Caching – ASP.NET Security.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand Microsoft .NET Framework and ASP.NET

2. Design web application with variety of controls

3. Handle session state management.

4. Use Microsoft ADO.NET to access data in web Application

5. Use XML for creating web services.

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	S	S	S	M	K - 2
CO 2	S	S	S	S	M	S	M	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	S	M	S	S	M	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	M	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book :

1. Mathew Mac. Donald, "ASP.NET The complete Reference", Tata McGraw – Hill Publishing Company Ltd., New Delhi.

2. ImarSpanjaars, ASP.NET 3.5 in C# and V.B. : "Wiley India Pvt Ltd.

Reference :

1. O"REILLY, Jesse Liberty, Dan Hurwitz and Brain Mac Donald, "Learning ASP.NET 3.5", II Edition.

B.Sc. Information Technology / Semester V / Core Practical 5

	L	T	P	C

.NET PROGRAMMING LAB　　　　　　　　L T P C

　　　　　　　　　　　　　　　　　　　　0 0 6 3

1. Arithmetic Operations Using Text Box and Button
2. Adding and Removing Items in runtime using Drop Down List and List Box.
3. Upload and display Image using File Up Load Control.
4. Display Date, Day, Month, Year, Day of Week, Day of the Year using Calendar Control.
5. Create an Advertisement using Ad rotator Control.
6. Create a Registration form and apply ASP.NET validation Controls.
7. Binding data in Grid view using Source.
8. Create small pay roll.
9. Create user control with Source.
10. Create a Login Page using Session Variable.
11. Create Student Mark List using SQL Provider.
12. Grid View, Edit, Update, Cancel and Delete using Source.
13. Create a Crystal Report.
14. Create a Simple Web Page Using CSS.
15. Create a Master Page.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand Microsoft .NET Framework

2. Become a .NET programmer

3. Design web application

4. Work with CSS

5. Examine Session variable

CO - PO - PSO Mapping

.NET PROGRAMMING LAB											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	M	S	S	S	S	S	S	S	M	K - 6
CO 5	S	M	S	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,　Moderately Correlated – M, Weekly Correlated - L

DEEP LEARNING

L T P C
4 0 0 4

COURSE OBJECTIVE:

To introduce the basic concepts and techniques of Deep Learning.

UNIT I

Introduction to Learning: The Neural Network – Limits of Traditional Computing – Machine Learning – Neuron – FF Neural Networks – Types of Neurons – Softmax output layers. Networks – Types of Neurons – Softmax output layers

UNIT II

Deep Learning Models: Tensor flow – Variables – Operations – Placeholders – Sessions – Sharing Variables – Graphs – Visualization

UNIT III

CNN: Convolution Neural Network – Feature Selection – Max Pooling – Filters and Feature Maps – Convolution Layer –Applications

UNIT IV

RNN Recurrent Neural Network – Memory cells – sequence analysis – word2vec- LSTM — Memory augmented Neural Networks – NTM—Application

UNIT V

Reinforcement Learning: Reinforcement Learning – MDP – Q Learning – Applications

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand the basic concepts and techniques of Deep Learning.

2. Explore Tensor flow

3. Create deep learning applications with

4. Analyze CNN, RNN applications

5. Train a model with Intelligent Agents

CO - PO - PSO Mapping

CO	DEEP LEARNING										COGNITIVE LEVEL
	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 2
CO 2	S	S	S	S	S	S	S	S	S	S	K - 6
CO 3	S	S	M	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	S	S	S	S	M	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book:

Nikhil Buduma, Nicholas Locascio, ―Fundamentals of Deep Learning: Designing NextGeneration Machine Intelligence Algorithms‖, O'ReillyMedia, 2017.

Reference:

1. Ian Goodfellow, YoshuaBengio, Aaron Courville, Deep Learning (Adaptive computation and Machine Learning series‖, MITPress, 2017.

2. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview

3. https://onlinecourses.swayam2.ac.in/arp19_ap79/preview

DATA WAREHOUSING AND DATA MINING	L	T	P	C

OBJECTIVES:

4 0 0 4

1. To understand and implement classical models and algorithms in data warehousing and data mining.
2. To analyze the data, identify the problems and choose the relevant models and algorithms.
3. To assess the strength and weaknesses of various data mining methods and algorithms

UNIT I :

Data Warehousing – Data warehousing Components: Overall Architecture - Datawarehouse Database- Sourcing, Acquisition, Cleanup, and Transformation tools – Metadata - Access Tools - Data Marts - Data Warehouse Administration and Management - Information Delivery System – Building a Data warehouse: Business Considerations : Return on Investment - Design Considerations - Benefits of Data Warehousing.

UNIT II :

Business Analysis -Tools categories - The Need for Applications - Need of OLAP - Multidimensional Data Model - OLAP Guidelines - Multidimensional versus Multirelational OLAP - Categorization of OLAP Tools - OLAP Tools and the Internet.

UNIT III :

Data Mining - Introduction – What is Data Mining? – Kinds of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives –Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing: Why Preprocess the Data?- Data Cleaning- Data Integration and Transformation.

UNIT IV

 Association Rule Mining and Classification - Mining Frequent Patterns, Associations and Correlations – Basic Concepts-: Frequent Itemset Mining Methods – The Apriori Algorithm – Mining Various Kinds of Association Rules – Classification and Prediction - What Is Classification? What Is Prediction? - Classification by Decision Tree Induction : Decision Tree Induction - Bayesian Classification : Bayes' Theorem - Naïve Bayesian Classification – Rule Based Classification : Using IF-THEN Rules for Classification - Rule Extraction from a Decision Tree –Classification by Backpropagation : A Multilayer Feed-Forward Neural Network - Defining a Network Topology – Backpropagation – Prediction : Linear Regression - Nonlinear Regression.

UNIT V:

Cluster Analysis: What Is Cluster Analysis? - Categorization of Major clustering Methods – Partitioning Methods : K means –Hierarchical Methods : Agglomerative and Divisive Hierarchical Clustering-– Density-Based Methods-DBSCAN- Data Mining Applications.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Explore the core concepts of Data Mining
2. Implement classical models and algorithms in data warehousing and data mining.
3. Analyze data, identify the problems and choose the relevant models and algorithms.
4. Assess the strength and weaknesses of various methods and algorithms
5. Differentiate Classification and Clustering

CO - PO - PSO Mapping

DATA WAREHOUSING AND DATA MINING											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	S	S	S	M	S	S	K – 2
CO 2	S	S	M	S	S	S	S	S	S	S	K – 6
CO 3	S	S	M	S	S	S	S	S	S	S	K – 4
CO 4	S	S	M	S	S	S	S	S	S	S	K – 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

TEXT BOOKS
1. Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, 2007.

REFERENCE BOOKS

1. Introduction to Data Mining by Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson Education 2007.

2. Insight into Data Mining Theory and Practice – K.P.Soman, Shyam Diwakar, V.Ajay, Prentice Hall of India, 2008.

3. Introduction to Data Mining with Case Studies by G.K.Gupta, PHI 3rd Edition, 2015.

CLOUD COMPUTING

L T P C

4 0 0 4

COURSE OBJECTIVE

1. Understand the core concepts of cloud computing

2. Learn the fundamental concepts about data centers and understand the tradeoffs in power, efficiency and cost.

3. Understand the use of cloud storage

UNIT I:

Introduction Cloud Computing Introduction, From, Collaboration to cloud, Working of Cloud Computing, Pros and Cons, Benefits, Developing Cloud Computing Services, Cloud Service Development, Discovering Cloud Services.

UNIT II:

Cloud Computing For Everyone Centralizing Email Communications, Cloud Computing for Community, Collaborating on Schedules, Collaborating on Group Projects and Events, Cloud Computing for Corporation, Mapping Schedules Managing Projects, Presenting on Road.

UNIT III:

Using Cloud Services Collaborating on Calendars, Schedules and Task Management, Exploring on Line Scheduling and Planning, Collaborating on Event Management, Collaborating on Contact Management, Collaborating on Project Management, Collaborating on Word Processing, Spreadsheets, and Databases.

UNIT IV:

Outside The Cloud - Evaluating Web Mail Services, Evaluating Instant Messaging, Evaluating Web Conference Tools, Creating Groups on Social Networks, Evaluating on Line Groupware, Collaborating via Blogs and Wikis.

UNIT V:

Storing And Sharing: Understanding Cloud Storage, Evaluating on Line File Storage, Exploring on Line Book Marking Services, Exploring on Line Photo Editing Applications, Exploring Photo Sharing Communities, Controlling it with Web Based Desktops.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Explain basic concepts of cloud computing
2. Apply fundamental concepts in cloud infrastructure
3. Understand network and storage virtualization
4. Collaborate via Blogs and Wikis
5. Store and share in Cloud

CO - PO - PSO Mapping

CLOUD COMPUTING											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 2
CO 2	M	S	S	S	S	S	S	S	S	S	K - 6
CO 3	M	S	S	S	S	S	M	S	S	S	K - 4
CO 4	M	S	S	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

TEXT BOOK:

Cloud Computing, Michael Miller, Pearson Education, New Delhi, 2009.

REFERENCE BOOK:

1. Cloud Computing, V. K. Pachghare, PHI Learning Pvt Ltd, 2016

2. Cloud Computing, Anthony T.Velte, Toby J.Velte, Pobert Elsenpeter, TMH, 2010.

3. Cloud Computing Bible, Barrie Sosinsky, Wiley Publishing, Inc.

DATA COMMUNICATIONS AND NETWORKING

COURSE OBJECTIVE:

L	T	P	C
4	0	0	4

1. To learn the basics of Communication Technologies and Data communication
2. To understand the fundamentals of transmission mediums and interfacing standards
3. To acquire knowledge about data compression techniques.

Unit – I

Data Communication: Standard Organizations – Line Configuration – Topology – Transmission Mode – Categories of Networks – Internet Works – The Model – Functions of the Layers.

Unit – II

Transmission of Digital Data: Interfaces and Modems – Digital Data Transmission – DTE – DCE Interface – other Interface Standards. Transmission Media: Guided Media – Unguided Media

Unit – III

Multiplexing – Many to one/one to Many, Frequency – Division Multiplexing (FDM), Wave – Division Multiplexing (WDM), Time – Division Multiplexing (TDM).

Unit – IV

Switching : Circuit Switching – Packet Switching – Message Switching – Integrated Services – Digital Network (ISDN) – Services – History – Subscribe Access to the ISDN – The ISDN Layers – Broadband ISDN – Future of ISDN.

Unit – V

Error Detection and Correction: Types of Errors – Detection – Redundancy – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cycle Redundancy Check (CRC) – Checksum – Error Correction. Data Link Control – Line Discipline – Flow Control – Error Control.

COURSE OUTCOME:

After completion of this course, the learner will be able to

CO1 Identify the importance of data communication systems

CO2 Analyze the different transmission media

CO3 Assess short range and long range wireless technologies

CO4 Understand error detection and correction mechanisms

CO5 Select the required networking devices

CO - PO - PSO Mapping

DATA COMMUNICATIONS AND NETWORKING											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	M	S	S	M	S	S	K – 2
CO 2	S	S	M	S	S	S	S	S	S	M	K – 4
CO 3	S	S	M	S	S	S	S	S	S	S	K – 4
CO 4	S	S	M	S	S	S	S	S	S	S	K – 2
CO 5	S	S	M	S	S	S	S	S	S	S	K – 3

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Books :

1. Data Communications and Networking – "Behrouz A Foruzan", Tata McGraw Hill Publishing Company Limited, New Delhi. 2nd Edition 2006.

2. Data Communications and Networking – Wayne Tomain – Pearson.

Reference Books :

1. Computer Networks – "Andrew S. Tanenbaum", - Prentice Hall of India, 4th Edition, 2006.

2. Data and Computer Communications "William Stallings Prentice Hall of India 2007

L T P C

0 0 5 5

Case studies to be done in Oracle

Divide the class into groups of three or four students. Each group should do any five case studies.

Case Study 1
Hospital Management System
A multi-specialty hospital includes a number of departments, rooms, doctors, nurses, compounders, and other staff working in the hospital. Patients with different ailments come to the hospital and get checkup done from the concerned doctors. If required they are admitted in the hospital and discharged after treatment.

The aim of this case study is to design and develop a database for the hospital to maintain the records of various departments, rooms, and doctors in the hospital. It also maintains records of the regular patients, patients admitted in the hospital, the check up of patients done by the doctors, the patients that have been operated, and patients discharged from the hospital.

Case Study 2
Railway Reservation
The railway reservation system facilitates the passengers to enquire about the trains available on the basis of source and destination, booking and cancellation of tickets, enquire about the status of the booked ticket, etc.

The aim of this case study is to design and develop a database maintaining the records of different trains, train status, and passengers. The record of train includes its number, name, source, destination, and days on which it is available, whereas record of train status includes dates for which tickets can be booked, total number of seats available, and number of seats already booked. The database has been developed and tested on the Oracle.

Case Study 3
Painting Hire Business
A local businessman has decided to start his own Internet business, called Masterpieces Ltd, hiring paintings to private individuals and commercial companies. The system must

be able to manage the details of customers, paintings and those paintings currently on hire to customers. Customers are categorized as B (bronze), S (silver), G (gold) or P (platinum). These categories entitle a customer to a discount of 0%, 5%, 10% or 15% respectively. Customers often request paintings by a particular artist or theme (eg animal, landscape, seascape, naval, still-life, etc). Over time a customer may hire the same painting more than once. Each painting is allocated a customer monthly rental price defined by the owner. The owner of the painting is then paid 10% of that customer rental price. Any paintings that are not hired within six months are returned to the owner. However, after three months, an owner may resubmit a returned painting. Each painting can only have one artist associated with it.

Several reports are required from the system. Three main ones are: 1. For each customer, a report showing an overview of all the paintings they have hired or are currently hiring 2. For each artist, a report of all paintings submitted for hire 3. For each artist, a returns report for those paintings not hired over the past six months

Case Study 4

XYZ is a medium sized Company dealing with industrial applications of computers. The Company delivers various products to its customers ranging from a single application program through to complete installation of hardware with customized software. The Company employs various experts, consultants and supporting staff. All personnel are employed on long- term basis, i.e. there is no short-term or temporary staff. Although the Company is somehow structured for administrative purposes (that is, it is divided into departments headed by department managers) all projects are carried out in an inter-disciplinary way. For each project a project team is selected, grouping employees from different departments, and a Project Manager (also an employee of the Company) is appointed who is entirely and exclusively responsible for the control of the project, quite independently of the Company's hierarchy.

The following is a brief statement of some facts and policies adopted by the Company.

• Each employee works in some department.

• An employee may possess a number of skills

• Every manager (including the MD) is an employee

• A department may participate in none/one/many projects.

• At least one department participates in a project.

• An employee may be engaged in none/one/many projects

• Project teams consist of at least one member.

For the above business stories you are expected to create the following.

Analyze the data required, Normalize the attributes, Create the logical data model (ER diagrams).

Case Study 5
Sales Recording And Report Management System For Supermarket

Case Study 6
Design and Implementation of an Online Library Management System

Case Study 7
Design and Implementation of Computerized Students Identity Card System

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Work in teams
2. Break complex tasks into parts and steps.
3. Plan and manage time.
4. Refine understanding through discussion and explanation.
5. Give and receive feedback on performance.

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	M	S	S	M	S	S	S	K - 4
CO 4	S	S	S	M	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

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OPERATING SYSTEM

L T P C

4 1 0 4

COURSE OBJECTIVE:
1. To explain the basic concepts of Operating System
2. To understand Inter process communication
3. To have an idea of page replacement strategies

Unit – I
Operating System : What is an Operating System? – Computing System Architecture : Desktop Systems – Multiprocessor Systems – Distributed Processing – Cluster Systems – Hand held Systems – Functions and Structure – Different services of the Operating System — issue of portability – users view of the operating system – Graphical user interface – Operating System Structure – virtual machine – booting.

Unit – II
Information Management : File System – Device Driver – Terminal I/O – CD – ROM.
Process Management : Introduction – What is process? Evolution of multiprogramming – Context Switching – Process States – Process State Transitions – Process Control Block – Process hierarchy – Operation on a process – create a process – kill a process – dispatch a process – change the priority of a process – Block a process – dispatch a process – time up a process wake up a process – Suspend/resume operation – Process Scheduling – Multithreading.

Unit – III
Inter Process Communication: the producer/Consumer Problems – solutions to the producer – consumer problems – Classical IPC problems.

Unit – IV
Deadlocks: Introduction – Graphical representation of deadlock – deadlock prerequisites – deadlock strategies.

Unit – V
Memory Management: Introduction – Single Contiguous memory management – fixed partition memory management – variable partitions – non contiguous allocation – paging – segmentation – combined system – virtual memory management system.

COURSE OUTCOME:
On successful completion of the course, the learners will be able to
CO1. Understand fundamental operating system abstractions
CO2. Explain shared memory concept
CO3. Explore File management, Memory management and Information management, Process management and storage virtualization
CO4. Analyze process scheduling algorithms
CO5. Appreciate the working of memory management algorithms

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	M	M	S	S	M	S	S	K – 2
CO 2	S	S	M	S	S	S	S	S	S	M	K – 4
CO 3	S	S	M	S	S	S	M	S	S	S	K – 4
CO 4	S	S	M	S	S	M	S	S	S	S	K – 2
CO 5	S	S	M	S	S	S	S	S	S	S	K – 3

Strongly Correlated – S, Moderately Correlated – M, Weekly Correlated - L

Text Book :
1. Operating Systems – Achyut S Godbole, Tata McGraw – Hill Publishing Company, New Delhi, 2nd Edition, 2005.
2. Operating System – Harvey M. Deitel, Paul J Deitel. David R. Choftness, Third Edition, Pearson.
Reference :
1. Operating Systems, Internals and Design Principles, William Stallings, PHI, 2008.
2. Operating System Concepts – Silberschatz and Galvin, 6th Edition, John Wiley & Sons, Inc., 2004.
3. An Introduction to Operating Systems – Concepts and Practice, Pramod Chandra P. Bhatt, Prentice Hall of India, 2007.
3. An Introduction to Operating Systems – Concepts and Practice, Pramod Chandra P. Bhatt, Prentice Hall of India, 2007.

B.Sc. Information Technology / Semester VI / Core 9

INTERNET OF THINGS

L T P C
4 1 0 4

COURSE OBJECTIVE:

1. To give a brief idea about the working of IOT

2. To make the students understand the Architecture of IOT

UNIT I:

Fundamentals of Internet of Things: Introduction – Characteristics of IoT – The Physical Design of IoT – Iot Architecture an Components – Logical design of IoT – Communication Models – IoT Communication API – IoT Architecture and Protocols – Introduction –Fog based Architecture of IoT – Near Field Communication – Wireless Sensor Networks – IoT Network protocol stack – IoT technology stack – Blue tooth – Zig Bee – and 6LowPAN.

UNIT II:

Programming Framework for IoT: Interoperability – Programming Paradigm – Assembly – Introduction to Arduino Programming – Introduction to Python Programming – Introduction to Raspberry Pi . Virtualization: Introduction – Types – Virtualization and IoT – Embedded Virtualization

UNIT III:

IoT Application Area: Introduction – Homes – Health care – Agriculture – Military applications – Politics – Constructions – Other application areas . Cloud and IoT : Introduction – Cloud – IoT – Difference between cloud and IoT – Cloud IoT architecture – challenges.

UNIT IV:

Smart City using IoT: Introduction – Concept – The emergence – Dimensions and Components – Design strategies – Factors affecting automation – IoT applications in smart cities – Education – E-governance – Industry . IoT Use Cases: Industrial IoT Use Case – IoT and smart energy – Smart transportation – Smart health – Smart home – Smart Education system – Governance use case – Smart cities

UNIT V:

Network Security for IoT and M2M communications: Introduction – Network Technologies for IoT and M2M – Security for IoT and M2M Technologies – Securities in IETF M2M network Technologies – Security in ETSI M2M Network Technologies – Other M2M standard Efforts

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Describe what IoT is and how it works
2. Recognize the factors that contributed to the emergence of IoT
3. Design and program IoT devices
4. Secure the elements of an IoT device
5. Analyze the communication protocols for IoT.

CO - PO - PSO Mapping

INTERNET OF THINGS											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	S	M	S	S	K - 2
CO 2	S	S	S	S	S	S	S	S	S	S	K - 6
CO 3	S	S	M	M	S	S	S	S	S	S	K - 4
CO 4	S	S	S	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Books:

1. Internet of Things – Principles, Paradigms and Applications of IoT by Dr.Kamlesh Lakhwani, Dr.Hemant Kumar Gianey, Joseph Kofi Wireko, Kamal Kant Hiran (BPB publication First Edition 2020)

2. Internet of Things(IoT) Systems and Applications By Jamil Y . Khan & Mehmet R.Yuce Jenny Stanford Publishing.

Reference Book

1.Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014

PYTHON PROGRAMMING

L T P C
4 0 0 4

COURSE OBJECTIVE:

1. To Build basic programs using fundamental programming
2. To work with user input to create interactive programs

Unit I

BASICS : Python - Variables - Executing Python from the Command Line - Editing Python Files - Python Reserved Words - Basic Syntax-Comments - Standard Data Types – Relational Operators - Logical Operators - Bit Wise Operators - Simple Input and Output.

Unit II

CONTROL STATEMENTS: Control Flow and Syntax - Indenting - if Statement - statements and expressions- string operations- Boolean Expressions -while Loop - break and continue - for Loop. LISTS: List-list slices - list methods - list loop – mutability – aliasing - cloning lists - list parameters. TUPLES: Tuple assignment, tuple as return value -Sets – Dictionaries.

Unit III

FUNCTIONS: Definition - Passing parameters to a Function - Built-in functions- Variable Number of Arguments - Scope – Type conversion-Type coercion-Passing Functions to a Function - Mapping Functions in a Dictionary – Lambda - Modules - Standard Modules – sys – math – time - dir - help Function. Using matplotlib

Unit IV

ERROR HANDLING: Run Time Errors - Exception Model - Exception Hierarchy - Handling Multiple Exceptions - Data Streams - Access Modes Writing - Data to a File Reading - Data From a File - Additional File Methods - Using Pipes as Data Streams - Handling IO Exceptions - Working with Directories.

Unit V

OBJECT ORIENTED FEATURES: Classes Principles of Object Orientation - Creating Classes - Instance Methods - File Organization - Special Methods - Class Variables – Inheritance – Polymorphism - Type Identification - Simple Character Matches - Special Characters - Character Classes – Quantifiers - Dot Character - Greedy Matches –

Grouping - Matching at Beginning or End - Match Objects – Substituting - Splitting a String - Compiling Regular Expressions.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Acquire programming skills in core Python.
2. Understand Object Oriented concepts in Python
3. Develop the skill of designing Graphical user Interfaces in Python
4. Know how to handle errors
5. Use lists, tuples, and dictionaries

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	M	S	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	S	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

(Table title: PYTHON PROGRAMMING)

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

TEXT BOOKS

1. Mark Summerfield. ―Programming in Python 3: A Complete introduction to the PythonLanguage, Addison-Wesley Professional, 2009.
2. Martin C. Brown, ―PYTHON: The Complete Reference, McGraw-Hill, 2001.

REFERENCES

1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
2. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
3. Wesley J Chun, ―Core Python Applications Programming‖, Prentice Hall, 2012.

B.Sc. Information Technology / Semester VI / Core Practical 6

PYTHON PROGRAMMING LAB

L T P C

0 0 6 3

1. Write a python program that displays the following information: Your name, Full address Mobile number, College name, Course subjects.
2. Write a python program to find the largest of three integers using if-else and conditional operator.
3. Write a python program to find the product of two matrices
4. Write recursive functions
   a. GCD of two integers.
   b. factorial of positive integer
5. Write a python program to sort a given sequence: String, List and Tuple.
6. Write a python program to make a simple calculator.
7. Write a python program to find the sum of array of numbers.
8. Write a python program for Inheritance.
9. Write a python program to slice a given list.
10. Write a python program to count the number of words.
11. Write a python program to copy a file.
12. Write a python program to check the given password is correct or not.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to
1. Acquire programming skills in core Python.
2. Understand Object Oriented concepts in Python
3. Use lists, tuples, and dictionaries
4. Build and package Python modules for reusability
5. Use exception handling in Python applications for error handling.

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	S	S	S	M	S	S	K - 2
CO 2	S	S	M	M	S	S	S	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	S	M	S	S	S	S	S	S	K - 6
CO 5	S	S	S	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

BIG DATA ANALYTICS

L T P C

COURSE OBJECTIVE:

4 0 0 4

1. To introduce the concept of Big Data
2. To understand the various algorithms in Big Data Analytics

UNIT I: From Data to Big Data: Introduction - No analytics without data - Databases - Raw data - Text - Images, audios and videos - The Internet of Things - From bytes to yottabytes: the data revolution - Big data: definition - The 3Vs model - Why now and what does it bring? - Conclusions. Big Data: Introduction - Beyond the 3Vs - From understanding data to knowledge - Improving decision-making - Things to take into account - Data complexity - Data quality: look out! Not all data are the right data - What else?...Data security - Big data and businesses - Opportunities – Challenges

UNIT II: Building an Understanding of Big Data Analytics: Introduction - Before breaking down the process. What is data analytics? - Before and after big data analytics - Traditional versus advanced analytics: What is the difference? - Advanced analytics: new paradigm - New statistical and computational paradigm within the big data context – Conclusions. Why Data Analytics and When Can We Use It? Introduction - Understanding the changes in context - When real time makes the difference - What should data analytics address? - Analytics culture within companies - Big data analytics application

UNIT III: Data Analytics Process: Introduction - Understanding data analytics is good but knowing how to use it is better! (What skills do you need?) - First phase: find the data - Second phase: construct the data - Third phase: go to exploration and modelling - Fourth phase: evaluate and interpret the results - Fifth phase: transform data into actionable knowledge - Disciplines that support the big data analytics process

UNIT IV: Supervised Vs Unsupervised Algorithms: - Supervised and unsupervised learning - Supervised learning: predict, predict and predict! - Unsupervised learning: go to profiles search! - Regression versus classification - Regression - Classification - Clustering gathers data - What good could it serve? - Principle of clustering algorithms -

Partitioning your data by using the K-means algorithm

UNIT V: Applications and Examples: Introduction - Which algorithm to use? - Supervised or unsupervised algorithm: in which case do we use each one? - What about other ML algorithms? - The duo big data/ML: example of use - Amazon

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand the basic concepts of big data analytics.
2. Acquaint with a set of well-known supervised and unsupervised learning algorithms.
3. Work with applications involving big data
4. Analyze different ML algorithms
5. Realize the need to partition data

CO - PO - PSO Mapping

BIG DATA ANALYTICS											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	S	S	S	S	S	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	S	S	S	S	S	M	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text book:

Data Analytics and Big Data -Soraya Sedkaoui, Wiley – ISTE 2018.

Reference Books

1. Michael Minelli, Michele Chamboss, Ambiga Dhiraj , "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for today's businesses" John Wiley, 2014.

2. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, EMC Education Services.

	L	**T**	**P**	**C**

CYBER SECURITY

L T P C
4 0 0 4

COURSE OBJECTIVES

1.   To introduce the concepts of various cyber security threats and attacks
2.   To understand the concepts of network and web security

UNIT I

Introduction to Cyber Security. Confidentiality, Integrity and Availability – Triad. Attacks: Threats, Vulnerabilities and Risk. Risk Management, Risk Assessment and Analysis. Layers of Security. Identification and Authentication – Factors. Authorization and Access Controls- Models, Methods and Types of Access Control.

UNIT II

Basics of Cryptography: Definitions and Concepts, Symmetric and Asymmetric Cryptosystems, Classical Encryption Techniques – Substitution Techniques, Transposition Techniques, Block Ciphers and Stream Ciphers, Hybrid Encryption Techniques, One-Time Pad. E-mail security, Internet and Web Security. Steganography and its detection, Data Encryption Standard (DES), Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange

UNIT III

Network and Wireless Attacks: Network Sniffing, Wireshark, packet analysis, display and capture filters, Ettercap, DNS Poisoning, ARP Poisoning, Denial of services, Vulnerability scanning, Setup network IDS/IPS, Router attacks, Man-in-the-middle Attack, Nmap, open ports, filtered ports, service detection, network vulnerability assessment, Evade anti-viruses and firewalls, Protocols, MAC Filtering, Packet Encryption, Packet Sniffing, Types of authentication, Attacks on WEP , WPA and WPA2 Encryption, fake hotspots.

UNIT IV

Network Security: IP security architecture, Security protocols, IPSec, Web Security – Firewalls, IDS, IDPS – Types and Technologies. Trusted systems – Electronic payment protocols. Network Security Applications, Authentication Mechanisms: Passwords, Cryptographic authentication protocol, Kerberos, X.509 LDAP Directory. Digital Signatures.

UNIT V

Web Security: Web Security: SSL Encryption, TLS, SET. Intrusion detection. Securing online payments- (OTP)

COURSE OUTCOME

On successful completion of the course, the learners will be able to
1. Outline the concepts of various security aspects like threats, attacks and authentication procedures
2. Compare the various security attacks by inspecting their characteristics
3. Analyze security issues in network and computer systems
4. Develop, test and evaluate secure software
5. Analyze and resolve security issues in networks

CO - PO - PSO Mapping

CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CYBER SECURITY											
CO 1	S	S	S	S	S	S	S	S	S	S	K - 2
CO 2	S	S	M	S	S	S	S	S	S	S	K - 6
CO 3	S	S	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	M	M	S	M	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Books

1. William Stallings; "Cryptography and Network Security: Principles and Practices", Fifth Edition, Prentice Hall Publication Inc., 2007.

2. Nina Godbole and SunitBelapore; "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publications,2011.

REFERENCE BOOKS

1. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

2. Michael E Whiteman and Herbert J Mattord; "Principles of Information Security", Vikas Publishing House, New Delhi, 2003.

3. Atul Kahate "Cryptography and Network Security" McGraw Hill Education(India), 2008.

4. Alfred J. Menezes, Paul. C. Van Oorschot, and Scott A. Vanstone "Handbook of Applied Cryptography", CRC press, Lib of Congress -2006

5. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview

6. https://onlinecourses.swayam2.ac.in/arp19_ap79/preview

MOBILE COMPUTING

L T P C

COURSE OBJECTIVE:

4 0 0 4

1. To highlight the features of Mobile Communication.
2. To understand the concepts of Mobile Protocols
3. To learn about package and deploying Applications.

Unit I

Basics of Communication Technologies: Components of a Wireless Communication System – Architecture of a Mobile Telecommunication System – Wireless Local Area Networks – Bluetooth Technology. Introduction to Mobile Computing and Wireless Networking: What is Mobile Computing ? Mobile Computing vs. Wireless Networking – Characteristics of Mobile Computing – Structure of Mobile Computing Application- Cellular Mobile Communication –Global System for Mobile Communications (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunications System (UMTS).

Unit II

MAC Protocols: Properties required of MAC Protocols – Wireless MAC Protocols : Some Issues- A taxonomy of MAC Protocols –Fixed Assignment schemes – Random Assignment Schemes –Reservation based Schemes. Mobile Internet Protocol: Mobile IP – Packet Delivery – Overview of Mobile IP – Desirable features of Mobile IP- Key mechanism used in Mobile IP – Route Optimization – Dynamic Host Configuration Protocol

Unit III

Mobile Transport Layer: Overview of TCP/IP – Terminologies of TCP/IP – Architecture of TCP/IP – An overview of the operation of TCP – Application Layer Protocols of TCP – TCP in Mobile Networks. Mobile Databases : Issues in Transaction Processing – Transaction Processing Environment –Data dissemination – Transaction Processing in Mobile Environment – Data Replication – Mobile Transaction Models – Rollback Process – Two-Phase Commit Protocol – Query Processing – Recovery.

Unit IV

Wireless Sensor Networks: WSN vs. MANET – Applications – Architecture of the Sensor Node – Challenges in the design of an effective WSN – Characteristics of Sensor Networks –WSN Routing Protocols –Target Coverage –Clustered Wireless Sensor Networks. Operating Systems for Mobile Computing: Special Constraints and requirements of Mobile O/S- A survey of Commercial Mobile Operating Systems – A Comparative study of Mobile OSs.

Unit V

Mobile Application Development and Protocols: Mobile Devices as Web Clients – WAP – J2ME – Android Application Development. Mobile Commerce: Applications of M-

Commerce – Business-to-Business(B2B) Applications –Structure of Mobile Commerce – Pros and Cons of M-Commerce – Mobile Payment Systems.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Understand the concepts of Mobile Communication.
2. Analyse next generation Mobile Communication System
3. Know various protocols of all layers for mobile and adhoc wireless communication networks.
4. Describe IP and TCP layers of Mobile Communication.
5. Appreciate and apply Mobile Communication in Business

CO - PO - PSO Mapping

MOBILE COMPUTING											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO 1	S	S	S	S	M	S	S	S	S	S	K - 2
CO 2	S	M	S	S	S	S	S	M	S	S	K - 6
CO 3	S	S	M	S	S	S	S	S	S	S	K - 4
CO 4	S	S	S	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book

Fundamentals of Mobile Computing –by Prasant Kumar Pattnaik, Rajib Mall, PHI.

Reference Books
1. Wireless and Mobile Communication, T.G. Palanivelu & R. Nakkeeran, PHI Learning Private Limited,2009
2. Wireless and Cellular Telecommunications, 3rd Edition William C.Y. Lee, McGraw Hill
3. Mobile Computing Technology, Applications and Service Creation, Ashok K. Talukder & Roopa R. Yavagal, TMH Publication
4. Wireless Communications and Networking made simple, Prof. Satish Jain, Vineeta Pillai, BPB

COMPUTER GRAPHICS

	L	**T**	**P**	**C**
	4	**0**	**0**	**4**

COURSE OBJECTIVE:

1. To develop skills and knowledge about computer graphics
2. To understand 2D and 3D transformations.

Unit I

Overview of Graphics System: Video Display Devices – Input Devices - Hard Copy Devices – Graphics Software.

Output Primitives: Points and Lines –Line drawing algorithms – DDA algorithm- Bresenham's line algorithm- Circle drawing algorithms: properties of circles – Mid-point circle algorithm

Unit II

Attributes of Output Primitives: Line attributes – Curve attributes – Character attributes.

Two- Dimensional Geometric Transformation: Basic Transformations – Matrix Representations and homogenous coordinates – Composite and other Transformations.

Unit III

Two-Dimensional Viewing: The viewing pipeline, viewing co-ordinate reference frame – Window to view port co-ordinate transformation – Two-dimensional viewing function.

Clipping Operations: Point clipping – Line clipping (only Cohen-Sutherland line clipping) – Polygon Clipping (only Sutherland-Hodgeman polygon clipping).

Unit IV

Interactive Input Methods: Input of graphical data – Input functions – Three dimensional display methods. Three Dimensional Geometric and Modeling Transformations: Translation - Rotation - Scaling

Unit V

Three Dimensional Viewing: Viewing Pipeline, Projections. Visible-surface deduction methods: Back- face deduction – Depth buffer method- A-Buffer Method – Scanline Method.

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Explore the core concepts of computer graphics
2. Analyze viewing, projection, modelling and transformation
3. Interpret the mathematical foundation of the concepts of computer graphics.
4. Understand the working of graphics display devices
5. Appreciate the working of clipping algorithms

CO - PO - PSO Mapping

COMPUTER GRAPHICS											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	M	S	S	S	S	S	S	K - 2
CO 2	S	S	S	S	S	S	S	S	M	S	K - 6
CO 3	S	M	S	S	S	S	S	S	S	S	K - 4
CO 4	S	M	M	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	S	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L

Text Book:

Computer Graphics C version, Second Edition, Donald Hearn, M.Pauline Baker, Pearson Publications.

Reference Books

1. Express Learning - Computer Graphics and Multimedia-ITL Education Solution Ltd.

2. Computer Graphics-A programming Approach 2/e-Steven Harrington-Mc Graw Hill Education Private Limited.

3. Computer Graphics, Multimedia and Animation - Malay K. Pakhira – PHI

L	T	P	C
0	0	6	6

Students are to take up project development activities (individual or group of maximum three students) with the guidelines given below:

- ❖ Problem Identification
- ❖ Develop a model for solving the problem
- ❖ A statement of system specification proposed to be developed
- ❖ Data Flow Diagram
- ❖ List of possible solution including alternatives and constraints
- ❖ Implementation phase (Hardware & Software)
- ❖ Testing & Validation of the developed system
- ❖ Report preparation
- ❖ Presentation of the project

COURSE OUTCOME:

On successful completion of the course, the learners will be able to

1. Develop a model to achieve the project's goal

2. Demonstrate sound technical knowledge of the selected project topic.

3. Undertake problem identification, formulation and solution.

4. Design solutions to complex problems utilising a systematic approach

5. Appreciate the steps involved in Software development process

CO - PO - PSO Mapping

PROJECT WORK											
CO	**PO**					**PSO**					**COGNITIVE LEVEL**
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
CO 1	S	S	S	S	S	S	S	S	S	S	K - 2
CO 2	S	M	M	S	S	S	S	S	S	S	K - 6
CO 3	S	M	S	S	S	S	S	S	S	S	K - 4
CO 4	S	S	M	S	S	S	S	S	S	S	K - 6
CO 5	S	S	M	S	S	S	S	M	S	S	K – 6

Strongly Correlated – S,   Moderately Correlated – M, Weekly Correlated - L