Course Name : **Bachelor of Science**
Discipline : **Information Technology.**
(For those who join in June 2023 and after)

II B.SC. INFORMATION TECHNOLOGY

Semester	Part	Subject Name	Hours	Credit	Int + Ext =Total	Local	Regional	National	Global	Professional Ethics	Gender	Human Values	Environment & Sustainability	Employability	Entrepreneurship	Skill Development	Subject Code	Revised / New / No Change / Interchanged & Percentage of Revision
III	Part 1	**Tamil**	6	3	25+75=100												**U24PT31**	**Interchanged from II semester**
	Part 2	**English**	6	3	25+75=100												**U24PE31**	**New**
	Core 5	**Python Programming**	5	5	25+75=100				✔					✔			**U24NTC31**	**Revised 25%**
	Core 6	**Lab: Python Programming**	5	3	40+60=100				✔					✔			**U24NTCP31**	**Revised 15%**
	Elective 3	**Web Programming/ Computer Algorithms/ Digital Image Processing**	4	4	25+75=100				✔					✔			**U24NTE31/ U24NTE32/ U24NTE33**	**New/ New/ New**
	Core 7	**Lab:** Web Programming	4	2	40+60=100				✔					✔		✔	**U24NTCP32**	**Credit Change**
	SLC	**Value Education**	-	3	25+75=100												**U24VE31**	**Interchanged from I sem**
	Total		**30**	**23**														
IV	Part 1	**Tamil**	6	3	25+75=100												**U24PT41**	**Interchanged from III semester**
	Part 2	**English**	6	3	25+75=100												**U24PE41**	**New**
	Core 8	**Lab:** Android	5	4	40+60=100				✔					✔			**U24NTCP41**	**Credit Change**

	Core 9	Data Communication and Networks	4	4	25+75=100				✔					✔		✔	**U24NTC41**	**Mark Change**
	Core 10	**Lab: Open Source Programming**	5	3	40+60=100				✔					✔			**U24NTCP42**	**Sem Changed from VI**
	Allied	Statistics	4	4	25+75=100				✔							✔	**U24MAAN41**	**Mark Change**
	SLC	**Environmental Studies**	-	2	25+75=100												**U24ES41**	**Interchanged from II sem**
	Total		**30**	**23**														

Year	Part	Subject	Credit	Int = Total	Code
I & II	Part V	NSS / NCC / Physical Education/ YRC / RRC	3	100 = 100	U22NS4 / U22NC4 / U22PS4 / U22YR4 / U22RR4

SELF LEARNING COURSE

Part	Course Code	Course Title	Hours	Credit	Marks		
					I	E	Tot.
SLC	**U24NTSL41**	**Industrial Training Programme**	60 Hrs	2	100	-	100

SEMESTER V

S.No.	Part	Course Code	Course Title	Hours	Credit	Marks		
						I	E	Total
1	Core11		Relational Database Management Systems	5	5	25	75	100
2	Core12		Python Machine Learning	6	5	25	75	100
3	Core13		Python Machine Learning Lab	6	4	40	60	100
4	Core14		Lab: Relational Database Management Systems	3	2	40	60	100
5	Core15		Operating Systems	5	5	25	75	100
6	Skill 4		Software Development lab	2	2	100	-	100
7	Skill 5		LAB: Network Simulator	2	2	40	60	100
8	Skill 6		Employability Skills	1	1	25	75	100
			Total	30	26			

SEMESTER VI

S.No.	Part	Course Code	Course Title	Hours	Credit	Marks		
						I	E	Total
1	Core16		Project	6	4	25	75	100
3	Core17		Lab: Dot Net Programming	6	3	40	60	100
4	Elective4		Software Engineering/System Analysis and Design/ Software Project Management	5	4	25	75	100
5	Core18		Artificial Intelligence	6	5	25	75	100
6	Core19		Cryptography and Cyber Security	5	5	25	75	100
8	Skill 6		LAB: Hardware Trouble Shooting	2	2	100	-	100
			Total	30	23			

SEMESTER III
Core 5

Course Title: Python Programming	**Total Hours : 65 Hrs**
Course Code: U24NTC31	**Total Credits: 5**

Course Outcomes:

Upon completion of the course, students will be able to

Cos	CO Statement
CO1	Learn the Basics of Python Environment and Data Types
CO2	Learn to process Inputs and Outputs
CO3	Design programs using Arrays and Subroutines
CO4	Describe the usage of the built-in data structures like "list", "tuple" and "dictionary"
CO5	Understand the basics of OOPs

UNIT I **13 Hours**

Introduction to Python: The History of Python-Getting Started with Python-Programming Style and Documentation- Programming Errors- Getting Started with Graphics Programming.

Elementary Programming: Introduction-Writing a Simple Program-Reading Input from the Console-Identifiers-Variables, Assignment Statements, and Expressions -Simultaneous Assignments- Named Constants-Numeric Data Types and Operators-Evaluating Expressions and Operator Precedence- Augmented Assignment Operators-Type Conversions and Rounding.

Mathematical Functions, Strings, and Objects: Introduction-Common Python Functions-Strings and Characters-Introduction to Objects and Methods -Formatting Numbers and Strings- Drawing Various Shapes -Drawing with Colors and Fonts.

UNIT II **13 Hours**

Selections: Introduction-Boolean Types, Values, and Expressions-Generating Random Numbers-**if** Statements-Two-Way **if-else** Statements-Nested **if** and Multi-Way **if-elif-else** Statements-Common Errors in Selection Statements-Logical Operators-Conditional Expressions-Operator Precedence and Associativity-Detecting the Location of an Object.

Loops: Introduction-The **while** Loop-The **for** Loop-Nested Loops-Minimizing Numerical Errors-Keywords **break** and **continue.**

Functions: Introduction-Defining a Function-Calling a Function-Functions with/without Return Values- Positional and Keyword Arguments- Passing Arguments by Reference Values-Modularizing Code-The Scope of Variables- Default Arguments-Returning Multiple Values-Function Abstraction and Stepwise Refinement.

UNIT III **13 Hours**

Objects and Classes: Introduction- Defining Classes for Objects- UML Class Diagrams-Immutable Objects vs. Mutable Objects-Hiding Data Fields-Class Abstraction and Encapsulation-Object-Oriented Thinking.

GUI Programming Using Tkinter: Introduction- Getting Started with Tkinter-Processing Events- The Widget Classes- Canvas- The Geometry Managers -Displaying Images-Menus - Popup Menus- Mouse, Key Events, and Bindings- Animations- Scrollbars- Standard Dialog Boxes.

Lists: Introduction- List Basics- Deck of Cards GUI-Copying Lists- Passing Lists to Functions-Returning a List from a Function- Searching Lists-Sorting Lists.

UNIT IV **13 Hours**

Multidimensional Lists: Introduction- Processing Two-Dimensional Lists-Passing Two-Dimensional Lists to Functions- Multidimensional Lists**.**

Inheritance and Polymorphism: Introduction- Super classes and Subclasses-Overriding Methods- The **object** Class- Polymorphism and Dynamic Binding- The **is instance** Function.

Files and Exception Handling: Introduction-Text Input and Output- File Dialogs-Retrieving Data from the Web-Exception Handling-Raising Exceptions-Processing Exceptions Using Exception Objects- Defining Custom Exception Classes-Binary IO Using Pickling.

UNIT V **13 Hours**

Tuples, Sets, and Dictionaries: Introduction- Tuples- Sets-Comparing the Performance of Sets and Lists-Dictionaries

Web development with Flask: Initialization – Routes and View functions – Server startup –A Complete application – The Request-Response Cycle – Flask Extensions.

Text Book:

1. Y. Daniel Liang, "Introduction to Programming using Python", Prentice Hall,2012.
2. Miguel Grinberg, "Flask Web Development", O"Reilly, Second Indian Reprint, 2015.

Unit I	Chapters: 1, 2,3 Pg. Nos. : Chapter 1(13 – 21) Pg. Nos. : Chapter 2(31 – 45) Pg. Nos. : Chapter 3(63 – 83)
Unit II	Chapters: 4,5, 6 Pg. Nos. : Chapter 4(91 - 95,100 - 105,110,116 - 118) Pg. Nos. : Chapter 5(133 - 151) Pg. Nos. : Chapter 6(171 - 183,187 - 190,192)
Unit III	Chapters: 7, 9,10 Pg. Nos. : Chapter 7(215 - 233) Pg. Nos. : Chapter 9(271 - 301) Pg. Nos. : Chapter 10(313 - 315,329 - 334,338 – 341)

Unit IV	Chapters: 11,12,13 Pg. Nos. : Chapter 11(361 - 365,377) Pg. Nos. : Chapter 12(399 - 411) Pg. Nos. : Chapter 13(439 - 448,452 – 465)
Unit V	Book 1: Chapter :14 Pg. Nos.: Chapter 14(475 - 485,487) Book 2: Chapter:2 Pg. Nos.: (7 – 17)

Reference Books:

1. Margnus Lie Hetland, "Beginning Python from novice to Professional", Second Edition, Dream TechPress, , 2008.
2. Allen Downey et al ,"Learning with Pythons" , , First edition, Dream tech Press, 2015.
3. Matic C.Brown ,"The Complete Reference Python", First edition MCGraw Hill Education, 2001.

e- Resources:

1. https://www.w3schools.com/python/
2. https://docs.python.org/3/tutorial/
3. https://www.tutorialspoint.com/python/index.htm
4. https://www.programiz.com/python-programming
5. https://www.geeksforgeeks.org/python-programming-language/learn-python-tutorial/
6. https://intellipaat.com/blog/tutorial/python-tutorial/

Core 6

Course Title: LAB: Python Programming	**Total Hours: 65 Hrs**
Course Code: U24NTCP31	**Total Credits: 3**

Course Outcomes:

Upon completion of the course, students will be able to

Cos	CO Statement
CO1	Demonstrate programs using simple Python statements and expressions
CO2	Explain control flow and functions in Python for solving problems
CO3	Develop Python programs by defining functions and calling them
CO4	Use Python data structures–lists,tuples&dictionaries for representing compound data
CO5	Design programs using OOP concepts in Python

1. Program to get a value from the User and print the following
   - Display Python version
   - Display Current Date and Time
2. Program to get values from the user through command line and perform addition operation.
3. Program to find those numbers which are divisible by 7 and multiple of 5, between 1500and 2700.
4. Program to guess a number between 1 and 9. Note: User is prompted to enter a guess. If the user guesses wrong then the prompt appears again until the guess is correct, on successful guess, user will get a "Well guessed!"message, and the program will exit.
5. Program to check the validity of password inputted by the users. Validation:
   - At least 1 letter between [a-z] and 1 letter between [A-Z].
   - At least 1 number between [0-9].
   - Atleast1 character from [$#@].
   - Minimum length 6 characters.
   - Maximum length16 characters.
6. Program to check whether a given array of integers contains any duplicate element. Return true if any value appears at least twice in the said array and return false if every element is distinct.
7. Perform any FIVE indexing and slicing operations in an array.
8. Program using function that accepts a string and calculate the number of upper case letters and lower case letters.
9. Program to print the even numbers from a given list using function.
10. Program to accept variable length arguments in a function and print the count of the non-negative values.
11. Program to return multiple values in a function.
12. Program to convert a given Decimal number to binary using recursion.
13. Write an anonymous function to sort the values in a list.
14. Write a program to square every item of a list.
15. Write a program using list to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings. Example: ['abc','xyz','aba','1221']Result: 2
16. Write a program to append a list to the second list.
17. Program to add elements dynamically to a set and find the maximum and minimum element.
18. Program to find the length of a set.
19. Program to check if a given value is present in a set or not.
20. Program to demonstrate any TWO operations in tuple.
21. Create a dictionary by keeping the usernames of 5 users as key and set the password as a value. Perform login validation using the available credentials.
22. Create a class and access its methods using the object.
23. Develop a program using two classes and perform inheritance.
24. Develop a program to initialize a variable using constructor.
25. Program to demonstrate operator overloading.
26. Program to perform read and write operations on a file.
27. Program to copy the contents of a file to another file.
28. Program to implement try, except and finally block statements.
29. Design a loan calculator using TKinter.

30. Popup menu based arithmetic operations using TKinter.
31. Program to display on image using TKinter.
32. Create a web application using Flask to display a home page along with FIVE links and create web pages for each link.

Elective 3

Course Title: Web Programming	**Total Hours : 50 Hrs.**
Course Code: U24NTE31	**Total Credits: 4**

Course Outcome:

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Design and implement dynamic websites with good aesthetic sense of designing and latest technical know - how's.
CO2	Analyze a web page and identify its elements and attributes.
CO3	Understand, analyze and apply the role of languages like HTML, CSS, JavaScript, PHP and protocols in the workings of the web and web applications.
CO4	Have a Good grounding of Web Application Terminologies, Internet Tools.
CO5	Learn different ways of connecting to MySQL through PHP, and how to create tables, enter data, select data, change data, and delete data.

UNIT I **10 Hours**

Rich Media: Canvas-Audio-Video Web Forms2.0: Placeholder- Autofocus- Required-AutoComplete-DataList- Input types- Looking to the future. Semantics: Extensibility-New Elements-Structure-Content Models.

UNIT II **10 Hours**

Understanding the JavaScript: Using Built-in Functions and Libraries-Responding to Events-Using Windows and Frames-Getting Data with Forms-Working with Style Sheets Using the W3C Dom-Using the Advanced DOM Features-Using the Graphics and Animation.

UNIT III **10 Hours**

Understanding PHP Basics: How PHP Works - Examining the Structure of a PHP Script - Looking at PHP Syntax - Writing PHP Code - Displaying Content in a Web Page - Using PHP Variables - Using PHP Constants - Understanding Data Types - Using Arrays - Using Dates and Times - Understanding PHP Error Messages - Adding Comments to Your PHP Script.

Building PHP Scripts: Setting Up Conditions - Using Conditional Statements - Repeating Actions with Loops - Using Functions - Organizing Scripts.

UNIT IV **10 Hours**

OOP: Introducing OOP - Developing an Object Oriented Script - Defining a Class - Using a Class in a Script - Using Abstract Methods in Abstract Classes and Interfaces - Preventing Changes to a Class or Method - Handling Errors and Exceptions - Copying Objects - Comparing Objects - Destroying Objects.

Tracking Visitors with Sessions: Understanding Sessions and Cookies - Using Sessions with Pass Data - Understanding Other Session Objects.

UNIT V **10 Hours**

Introducing MySQL: Understanding DB Structure – MySQL Protecting with MySQL Databases.

Communicating with Communicating with the Database from PHP Scripts: Knowing How MySQL and PHP Work Together - PHP Functions That Communicate with MySQL - Communicating with MySQL - Selecting a Database - Handling MySQL Errors - Using Other Helpful mysqli Functions - Converting mysqli Functions to mysql Functions.

Validating web forms with JavaScript and PHP: Understanding How to Validate Web Forms - Performing Basic JavaScript Validation - Performing PHP Validation.

Text Book:

1. Jeffrey Zeldman Jeremy Keith,"HTML5 FOR WEB DESIGNERS, FOREWORD",2010
2. Michael Moncur ,"JavaScript in 24 Hours", Pearson Education,2007.
3. Steven Suehring and Janet Valade ,"PHP, MySQL, JavaScript& HTML5 ALL - IN - ONE FOR DUMMIES",A Wiley Brand , 2013.

Unit I	Book 1: Chapters :3,4,5 Pg. Nos.: (22 – 77)
Unit II	Book 2: Chapters :1, 8,9,10,11,12,13,14,19 Pg. Nos.: (7 - 17,121 - 225,313 – 319)
Unit III	Book 3: Chapters: 1, 2 Pg. Nos.: (271 – 359)
Unit IV	Chapters: 4, 6 Pg. Nos.: (397 - 423,437 – 446)
Unit V	Chapters:1 (MySQL) Chapters: 5, 3 Pg. Nos.: 449 - 454 Pg. Nos.: 515 - 526,555 – 585

Reference Books:

1. Robin Nixon ,"Learning PHP, MySQL & JavaScript 5e", O'Reilly Media, Inc ., 2018.
2. Steven Holzner ,"The complete reference PHP", Tata McGraw - Hill Edition,2007.

e-Resources:

1. https://www.w3schools.com/js/
2. https://www.tutorialspoint.com/javascript/index.htm
3. https://www.tutorialspoint.com/php/php_and_mysql.htm

Elective 3

Course Title: Computer Algorithms	**Total Hours : 50 Hrs.**
Course Code: U24NTE32	**Total Credits: 4**

Course Outcome:

Upon completion of the course, students will be able to

Cos	CO Statement
CO1	To develop efficient programs in terms of execution time and memory space.
CO2	Analyze the developed programs to compute order of computing time.
CO3	Understand the different techniques in searching and sorting
CO4	To develop programs based on the Algorithmic techniques namely Divide and conquer, Dynamic programming, Greedy method, Backtracking and Branch and Bound.
CO5	Know the importance of minimizing computing time and how these algorithmic techniques make the program execution faster.

UNIT I **10 Hours**

Algorithms: Importance of developing efficient algorithms – Analysis – order – Branch and Bound: Illustrating with 0/1 Knapsack.

UNIT II **10 Hours**

Divide and Conquer: Binary Search – Merge sort – divide and conquer approach - Quick Sort – Arithmetic with large numbers.

UNIT III **10 Hours**

Dynamic Programming: Binomial coefficients – Floyd's algorithm for shortest paths – Dynamic programming and optimisation problems – chained matrix multiplication – Optimal binary search tree – The travelling salesperson problem.

UNIT IV **10 Hours**

Greedy Approach: Minimum spanning trees – Dijkstra's algorithm for single source shortest path – Scheduling - Huffman code.

UNIT V **10 Hours**

Backtracking: The Backtracking techniques - n Queens Problem – Monte carlo algorithm to estimate the efficiency of a backtracking algorithm - Sum of Subsets – Graph Colouring – Hamiltonian circuits.

Text Book:

1.Richard Neapolitan, Kumars Naimipour,"Foundations of Algorithms Using C++ Pseudocode", Third edition, Narosa Publication, 2004.

Unit I	Chapters: 1,6 (1.1 to 1.4, 6.1) Pg. Nos.: (1- 39, 233 – 246)
Unit II	Chapter: 2 (2.1 - 2.4, 2.6) Pg. Nos.: (47 - 66,72-78)
Unit III	Chapter: 3 (3.1 - 3.6) Pg. Nos.: (91 – 132)
Unit IV	Chapter: 4 (4.1 to 4.4) Pg. Nos.: (137 – 175)
Unit V	Chapter: 5 (5.1 to 5.6) Pg. Nos.: (187 – 217)

Reference Books:

1. Ellis Horrowitz, SartajSahni, SanguthevarRajasekaran,"Fundamentals of Computer Algorithms", Galgotia publications 2005.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein,"Introduction to Algorithms,Prentice Hall of India, 2006.

e-Resources:

1. https://www.geeksforgeeks.org/fundamentals-of-algorithms/
2. https://www.tutorialspoint.com/data_structures_algorithms/index.htm

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Elective 3

Course Title: Digital Image Processing	**Total Hours : 50 Hrs**
Course Code: U24NTE33	**Total Credits: 4**

Course Outcome:

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Understand the basics of Image Processing
CO2	Learn about the Image Transformations
CO3	Analyse image enhancement and restoration techniques
CO4	Evaluate image segmentation Techniques
CO5	Examining image compression Techniques

UNIT I **10 Hours**

Introduction to Image-Processing System: Introduction-Image Sampling-Quantisation - Resolution-Human Visual System-Classification of Digital Images-Elements of Image Processing System-Image File Formats – Applications of Digital Image Processing.

UNIT II **10 Hours**

Image Transforms: Introduction- Need for Transform-Image Transforms-Fourier Transform-2D Discrete Fourier Transform-Properties of 2D-DFT.

Image Enhancement: Introduction-Image Enhancement in Spatial Domain-Enhancement through Point Operation-Types of Point Operation-Histogram Manipulation-Spatial Domain High-Pass Filtering.

UNIT III **10 Hours**

Image Restoration and Denoising: Introduction-Image Degradation-Types of Image Blur-Classification of Image-restoration Techniques-Image-Restoration Model-Linear Image Restoration Techniques-Non-Linear Image Restoration Techniques - Image Denoising-Classifications of Noise in Image-Median Filtering-Trimmed Average Filtering.

UNIT IV **10 Hours**

Image Segmentation: Introduction-Classification of Image Segmentation Techniques-Region approach to Image Segmentation-Clustering Techniques-Image segmentation based on Thresholding-Edge based Segmentation – Classification of Edges – Edge Detection-Edge Linking-Shape Representation-Classification if Shape-representation Techniques.

UNIT V **10 Hours**

Image Compression: Introduction-Need for Image Compression-Redundancy in Images-Classification of Redundancy in Images – Image Compression Scheme – Classification of Image-Compression Scheme-Huffman Coding-Wavelet based Image Compression – Fractal Image Compression

Text Book:

1. S.Jayaraman,S.Esakkirajan,T.Veerakumar,"Digital Image Processing",First edition,2017.

Unit I	Chapter: 1.1 - 1.10 Pg. Nos.: 1 – 43
Unit II	Chapters:4,5 (4.1 to 4.6, 5.1 to 5.5,5.10,5.12) Pg. Nos.: (152 – 173,243 – 252,278 – 291)
Unit III	Chapter: 6.1 - 6.5,6.10,6.11 Pg. Nos.: (324 - 344,348 – 349)
Unit IV	Chapter: 7.1 - 7.9,7.13 Pg. Nos.: (368 -392, 397)
Unit V	Chapter: 9.1 to 9.6,9.10,9.19,9.20 Pg. Nos.: (444 – 447,452 - 457,507 – 511)

Reference Books:

1. B.Chanda and D.DuttaMajumder,"Digital Image Processing and Analysis",PHI Publications,Second edition,2011

2. Anil K.Jain,"Fundamentals of Digital Image Processing",PHI Publications,First edition,2015.

e-Resources:

1. https://www.geeksforgeeks.org/digital-image-processing-basics/
2. https://www.tutorialspoint.com/dip/index.htm
3. https://www.javatpoint.com/digital-image-processing-tutorial

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Core 7

Course Title: **LAB: Web Programming**	Total Hours: 50
Course Code: U24NTCP32	Total Credits: 2

Course Outcome:

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Build dynamic web pages using JavaScript (Client side programming).
CO2	Use scripting languages and web services to transfer data and add interactive
	Components to web pages.
CO3	Select and apply Markup Languages for processing, identifying, and presenting information in web pages
CO4	Implement static, dynamic and interactive web pages and web applications.

JAVA SCRIPT

1. Write a JavaScript to design a simple calculator.
2. Write a JavaScript program to implement Built-in Functions and Libraries.
3. Write a JavaScript program to demonstrate Events.
4. Write a JavaScript program to demonstrate windows and Frames.
5. Write a JavaScript program to demonstrate Data with Forms.
6. Write a JavaScript program to create a Movable Layer.
7. Write a JavaScript program to create a Navigation Tree.
8. Write a JavaScript to Implement Animated Slideshow.
9. Write a JavaScript program to validate USER LOGIN page.
10. Write a JavaScript program for validating REGISTRATION FORM.

PHP & MYSQL

11. Write a PHP program to Implement Decision Making Statements.
12. Write a PHP program to Implement Iterations.
13. Write a PHP program to Implement Arrays.
14. Write a PHP program to display Book details using Foreach Loop
15. Write a PHP program to Implement Functions.
16. Write a PHP program to implement include and require functions.

17. Write a PHP program to demonstrate class and objects.
18. Write a PHP program to demonstrate Interface.
19. Write a PHP program to demonstrate Exceptions.
20. Create a Login Module to Implement Sessions in PHP.
21. Write a PHP program to demonstrate Cookies.
22. Retrieve and process Employee Pay - bill calculation using PHP & MY-SQL.
23. Retrieve and process EB - Bill calculation using PHP & MY-SQL.
24. Create Dynamic College website using HTML5, JavaScript, PHP&MY-SQL.

SEMESTER IV

Core 8

Course Title: LAB : Android	**Total Hours : 65 Hrs**
Course Code : U24NTCP41	**Total Credits : 4**

Course Outcomes:

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Develop Mobile Application based on open source software
CO2	Design User Interface and develop activity for Android App
CO3	Learn to use layout and implements widgets into layout
CO4	Use menu, Dialog box, toast, intent
CO5	Develop app with security feature

1) Develop an Android Application using linear layout.
2) Develop an Android Application using relative layout.
3) Develop an Android Application using table layout.
4) Develop an Android Application using frame layout.
5) Develop an Android Application using Absolute layout.
6) Develop an Android Application using toast control.
7) Develop an Android Application using Button control.
8) Develop an Android application using Radio Button.
9) Develop an Android application using Check Box.
10) Develop an Android application using picker views.
11) Develop an Android Application using intents.
12) Develop an Android Application for passing value from one activity to another activity.
13) Develop an Android application for calling build in intents
14) Develop an Android Application using Listview control
15) Develop an Android Application using spinner view control
16) Develop an Android Application using menu.
17) Develop an Android Application using fragments.
18) Develop an Android Application to add data into SQLite.

Core 9

Course Title : Data Communication and Networks	**Total Hours : 50 Hrs**
Course Code : U24NTC41	**Total Credits : 4**

Course Outcomes:

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Gain the Knowledge about the Data communication, Analog and Digital Signal
CO2	Acquire Practical ability of doing the encryption and decryption
CO3	Understand the process flow of the data exchange
CO4	Determine the Internetworking Devices
CO5	Manipulate the IP address and logical address

UNIT I 10 Hours

Introduction to Data Communications and Networking: Introduction – Fundamental concepts – Data communications – Protocols – Standards – Standards organizations – Signal Propagation – Analog and Digital signals – Bandwidth of a signal and medium.

Information Encoding: Introduction – Representing different symbols – Minimizing errors – Multimedia – Multimedia and data compression.

Analog and Digital Transmission Methods: Introduction – Analog signal, Analog transmission – Digital signal, Digital transmission – Digital signal, Analog transmission – Baud rate and Bits per second – Analog signal, Digital transmission – Nyquist theorem.

UNIT II 10 Hours

Modes of Data Transmission and Multiplexing: Introduction – Parallel and serial communication – Asynchronous, Synchronous and Isochronous communication – Simplex, Half-duplex and Full-duplex communication – Multiplexing – Types of multiplexing – FDM versus TDM.

Transmission Errors: Detection and Correction: Introduction – Error classification– Types of errors – Error detection.

Data Compression and Encryption: Introduction – Simple coding scheme – Scheme based on the context of the symbols – Statistical compression –Multimedia storage formats – Data Encryption – Risks Involved – Basic concepts – Digital Signature.

UNIT III 10 Hours

Transmission media: Introduction – Guided media – Unguided media – Shanon capacity. Network Topologies, Switching and Routing algorithms: Introduction – Mesh Topology – Star Topology – Tree Topology – Ring Topology – Bus Topology – Hybrid Topology – Switching Basics – Circuit switching – Packet switching – Message switching – Router and Routing – Factors affecting routing algorithms – Routing algorithms – Approaches

to routing.

Networking protocols and OSI model: Introduction – Protocols in Computer Communications – The OSI model – OSI layer functions.

UNIT IV 10 Hours

LAN, MAN and WAN: Introduction – Local Area Networks – Ethernet – Token Ring – Fiber Distributed Data interface – Metropolitan Area Network – Distributed Queue Dual Bus – Switched Multimegabit Data Services – Wide Area Network – WAN Architecture – WAN Transmission media – WAN Addressing – Packet forwarding – Next- hop tables and routing - Aloha.

Internetworking concepts, Devices, Internet basics, History and Architecture: Introduction – Why Internetworking? – Problems in internetworking – Dealing with incompatibility issues – A Virtual network – Internetworking devices – Repeaters – Bridges – Routers – Gateways – A brief history of internet – Internet topology – Internal Architecture of an ISP.

UNIT V 10 Hours

TCP/IP: Introduction – TCP/IP Basic – Why IP Address? – Logical Address – TCP/IP Example – The concept of IP Address – Address Resolution Protocol (ARP) - Reverse Address Resolution Protocol (RARP) – Internet Control Message Protocol(ICMP)

TCP, UDP: Introduction – TCP basics – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Connections: Passive open and Active open – TCP Connections – What makes TCP reliable? – TCP packet format – Persistent TCP connections – User Datagram Protocol (UDP) – Differences between UDP and TCP.

Text Book:

1. Achyut S Godbole ,"Data Communications and Networks", Tata McGraw Hill, 16th Reprint 2009.

Unit I	Chapters:1,2,3 (1.0 - 1.8, 2, 3) Pg. Nos.: (1 – 12) Pg. Nos.: (23 – 54)
Unit II	Chapters: 4, 5, 6 Pg. Nos.: (58-112)
Unit III	Chapters :7, 8, 9 Pg. Nos.: (118-182)
Unit IV	Chapters: 10, 15 Pg. Nos.: (183-211,217-303)
Unit V	Chapters: 16,17 Pg. Nos.: (318-378)

Reference Books:

1. Andrew Tanenbaum and David J.Wetherall ," Computer Networks" , 5th edition, Pearson Education Inc.,2011

2. Behrouz A. Forouzan ,"Data Communication and Networking", 4th edition, Tata McGraw Hill, 2009

e-Resources:

1. https://www.tutorialspoint.com/data_communication_computer_network/index.htm
2. https://www.javatpoint.com/computer-network-tutorial
3. https://www.geeksforgeeks.org/computer-network-tutorials/
4. https://www.softwaretestinghelp.com/computer-networking-basics/

Core 10

Course Title : Lab: Open Source Programming	**Total Hours : 65 Hrs**
Course Code : U24NTCP42	**Total Credits : 3**

Course Outcomes:

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Understand the basics of the open source framework
CO2	Experiment with Node JS Modules and Node Package Manager
CO3	Use MySQL to store data in a database
CO4	Create Interface to a MongoDB database and a web service
CO5	Build advanced, scalable and high performance web applications

1. HelloWorld using Node.js
2. Modules in Node.js
3. Require function in Node.js
4. HTTP module in Node.js
5. File system in Node.js
6. Events in Node.js
7. File upload in Node.js
8. Retrieve contents from MySQL in Node.js
9. Create and Sort MongoDB using Node.js
10. Perform Insert, Delete and Update in MongoDB using Node.
11. Query MongoDB database using Node.js

Allied Course II

Course Title : **STATISTICS**	Total Hours : 52 Hrs
Course Code : **U24MAAN41**	Total Credits : 4

Course Outcomes

Upon completion of the course, students will be able to

COs	CO Statement
CO1	Analyze statistical data using measures of central tendency, dispersion and location.
CO2	Understand skewness and able to distinguish it both from central tendency and

	dispersion.
CO3	Describe how correlation is used to identify relationships between variables and how regression analysis is used to predict outcomes
CO4	Define the principal concepts about probability and Calculate probabilities using Conditional probability
CO5	To examine whether the observed results are in order with the expected values.

UNIT I **10 Hours**

Meaning, Definition, functions of an Average, Characteristics of a typical average, Arithmetic mean, Mathematical characteristics, Weighted Arithmetic mean-' 'Median: calculation of median, Individual series, Under even numbers- 'Mode: Method of calculation of Mode, Discrete series, Graphic Location of Mode, Relationship Between Different Averages'- Geometric mean, Uses, Merits, Demerits, Harmonic mean, Calculation of Harmonic mean, Relationship Between Mean, Geometric Mean and Harmonic Mean

UNIT II **10 Hours**

Skewness : Introduction, meaning, skewness, Test of Skewness, Dispersion and Measures Objective (Karl Pearson's coefficient of skewness and Bowley's coefficient of skewness only)'-Kurtosis, Meaning

UNIT III **10 Hours**

Introduction, Definition, Significance of the Study of Correlation, correlation and Causation, Types of Correlation, Method of Studying Correlation, Graphic, Kar pearson's Coefficient of Correlation, properties, Assumptions, Merits and Demerits, Correlation – Karl Pearson's Co-efficient of correlation (use only one formula $r - \sum xy / \sqrt{\sum x^2 \sum y^2}$) – Regression Introduction, Definition, Uses, Significance of Regression Study, Correlation and Regression Difference between the two' Method of Studying Regression Graphic Method, Algebraic Method, Regression Line, Regression Equation.

UNIT IV **11 Hours**

Probability - conditional probability (definition, theorems statement and solved examples only)

UNIT V **11 Hours**

Random Variables (Discrete random variable) - Chi-Square Test

TEXT BOOKS

1. Statistics Theory and Practice - R.S.N. Pillai, Bagavathi, S.Chand& company Pvt. Ltd.
2. Statistics – Dr.S.Arumugam and Mr.A.Thangapandi Isaac - New Gamma publishing house, 2015.

Unit I	(TextBook 1) Chapter 9 (Pg.No.124-133 , 146-154 , 173-179 , 182 , 191)

Unit II	(TextBook 1)Chapter 11 (Pg.No.338-345 , 348-355 , 361-377)
Unit III	(Text Book 1) Chapter 12 , 13 (Pg.No.396-408 , 465-504)
Unit IV	(TextBook 2) Chapter11(Pg.No.274-300)(Theorems proof excluded)
Unit V	(TextBook2) Chapter 12(Pg.No.304-309 , 318), Chapter 16 (Pg.No.455-457)

REFERENCE BOOKS

1. "Fundamentals of Mathematical Statistics", S.C.Gupta and V.K.Kapoor, Sultan Chand & Sons, 12th Edition, 2020.
2. "Fundamentals of Statistics", S.C.Gupta, Himalaya Publishing House, 7th Edition, 2018.
3. "Statistics for Management", Richard L.Levin, David S.Rubin, Masood H.Siddiqui and Sanjay Rastogi, Pearson, 8th Edition, 2017.

e – RESOURCES:

1. https://www.youtube.com/watch?v=Urz4NGkXwis
2. https://www.youtube.com/watch?v=11c9cs6WpJU
3. https://www.youtube.com/watch?v=sqDVrXq_eh0
4. https://www.youtube.com/watch?v=DuQ0Bma5L0Y
5. https://www.youtube.com/watch?v=EK3_bOWcXAM
