DAV UNIVERSITY JALANDHAR

FACULTY OF SCIENCE

Course Scheme and Syllabus
for

Post Graduate Diploma in Computer Applications/Bridge Course

(One YearDiploma Course)
1st and 2ndSemester

Eligibility: Graduation with 50% Marks (For SC/ST: 45% Marks)

Syllabi Applicable for 2024 Batch& Onwards

Semester 1

S.No	Paper Code	Course Title	L	T	P	Cr
1	CSP501P	Computer Fundamentals and Office Automation	2	0	2	3
2	CSP502P	Algorithm Design and Programming Using C	3	0	2	4
3	CSP503P	Database Concepts	3	0	2	4
4	CSP504P	Computer Organization and Architecture	3	0	0	3
5	CSP505P	Information Systems	4	0	0	4
6	CSP506P	Workshop on App Development	0	0	4	2
			15	**0**	**10**	**20**

Semester 2

S.No	Paper Code	Course Title	L	T	P	Cr
1	CSP507P	Web Designing	1	0	2	2
2	CSP508P	Computer Networks	3	0	2	4
3	CSP509P	Operating System	3	0	0	3
4	CSP510P	Object Oriented Programming using C++	3	0	2	4
5	CSP511P	Data Structure	3	0	2	4
6	CSP512P	Software Engineering	3	0	0	3
			16	**0**	**8**	**20**

L	T	P	Credits
3	0	2	4

Course Code	CSP501P						
Course Title	Computer Fundamentals and Office Automation						
Course Outcomes	On the completion of the course the student will be able to CO1: Illustrates different components of computer, its Characteristics, generations and application. Explain different number system used in computer system and binary arithmetic. CO2: Introduce computer memory and I/O devices. Explain different computer languages and types of computer operating system. CO3: Discusses DOS history and various DOS commands. Introduce features of MS word and its usage. CO4: Introduce excel worksheet and various excel functions. Explain use of MS-Power point and MS-Access.						
Examination Mode	Theory/ Practical/ Theory + Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	5%
Syllabus							**CO Mapping**
Unit 1	**Fundamentals of Computer & Number System**						CO1
	Block Structure of a Computer, Characteristics of Computers, Computer generations, Applications of Computers. Classification of Computers on the Basis of size and chronology.						
	Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other representation of characters, integers and fractions.						
	Binary Addition, subtraction and multiplication.						
Unit 2	**Operating System, Memory Types & Input/output Devices**						CO2
	RAM, ROM, Cache and Secondary memory.						
	Input devices: Keyboard, Mouse, Light pen, Joystick, Mouse, OCR, OMR, MICR. Output devices: Monitor, Impact, non-impact, working mechanism of Drumprinter, Dot Matrix printer, Ink jet printer and Laser printer, plotters.						
	Machine language, assembly language, higher level language, 4GL and introduction to Compiler, Interpreter, Assembler.						
	Batch, multi programming, time sharing, multiprocessor operating system, online and real time operating system,distributed operating system.						
Unit 3	**Disk Operating System & MS Word**						CO3
	DOS–History, Internal and External Commands, Batch Files						
	Salient Features of MS WORD, Creating, saving, opening and printing files, formatting pages, paragraphs and sections, checking Spelling and grammar; creating lists and numbering. Headings, styles, fonts and font size. Finding						

	and replacing text, inserting page breaks, page numbers, symbols, images and dates. Using tables, header, footer. Using mail merge features.	
Unit 4	**MS Excel, MS PowerPoint and MS Access**	CO4
	Excel Worksheet, Data Entry, Editing, Cell Addressing Ranges, Copying & Moving Cell Content, Inserting and Deleting Rows and Column, Column Formats, Printing, Creating, displaying charts, Working with functions - Date and time function, Statistical function, Mathematical and Trigonometric functions, Text function, Logical functions.	
	Presentation overview, entering information, Presentation creation, opening and saving presentation, using transitions and animations.	
	Creating a Database using MS Access, Basic Tables, Using Queries, Using the Auto Form Feature, Form Design, Using the Auto Report Feature, Report Design, Copying Data, Freezing Columns, Printing Tables, Printing Reports, Sorting Records, Using the Filter Sorts, Renaming Columns.	
Reference Book/s	1. *Sinha, P.K.and Sinha,P., Foundations of Computing. NewDelhi: BPB First Edition, 2002.* 2. *Norton Peter, Introduction to Computers, McGraw Hill.* 3. *Rajaraman V, Fundamentals of Computers, New Delhi: Prentice Hall of India, Second Edition,1996.* 4. *Jain Satish, MS Office 2010 Training Guide, Delhi: BPB Publications, 2010* 5. *Shelly G.B, Cashman Thomas J., and Verma at Misty E., Microsoft Office Word 2007: Complete Concepts and Techniques, New Delhi: Cengage Learning, 2007* 6. *Subramanian N, Introduction to Computers, Noida, UP, India: Tata McGraw Hill,1989* 7. *Cyganski D, Orr J A, Information Technology Inside and Outside, New JerseyUSA : Pearson Education 2002.*	

In hours			
L	**T**	**P**	**Credit**
3	0	2	4

Course Code	**CSP502P**						
Course Title	**Algorithm Design and Programming Using C**						
Course Outcomes	On the completion of the course the student will be able to CO1: To define the concept of problem solving and steps to solving problems in computer application are using algorithms, pseudo-codes and flowcharts sequential, selection and repetition structure. CO2: To understand the Concept of fundamentals of programming & Control structure. CO3: Apply the concepts of Function, arrays, Structure & Union. CO4: Demonstrate the ability to write C programs using pointers and file handling.						
Examination Mode	Theory/ Practical/ Theory + Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	5%
Syllabus							CO Mapping
Unit 1	Fundamentals of algorithms and programming, Operations and Expressions & Control Structures						CO1
	Concept: problem-solving, Problem-solving techniques (Trial & Error, Brainstorming, Divide & Conquer), Steps in problemsolving (Define Problem, Analyze Problem, Explore Solution), Algorithms and Flowcharts (Definitions, Symbols), pseudo-codes.						
	Character Set, Identifiers and Key Words, Data Types, Constants, Variables, Expressions, Statements, Symbolic Constants and Operators & its types.						
	Single Character Input, Single Character Output, Entering Input Data More About Scan Functions, Writing Output Data, More About Print Functions, Gets and Puts Functions, Library functions.						
Unit 2	Decision Making and Looping Statements & Array						CO2
	Introduction, Decision Making with If–Statement, If Else and Nested If, While And Do-While, For Loop, Jump Statements: Break, Continue, Go to, Switch Statement.						
	Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String Handling Functions.						
Unit 3	Functions, Structure and Union						CO3
	Introduction To Functions, Function Declaration, Function Categories, Standard Functions, Parameters and Parameter Passing, Pass – By Value/ Reference, Recursion, Global and Local Variables, Storage Classes.						

	Declaration of Structure, Accessing Structure Members, Structure Initialization, Arrays of Structure, Nested Structures, Unions.	
Unit 4	Pointers, Files & Preprocessor Directives	CO4
	Introduction To Pointers, Address Operator and Pointers, Declaring and Initializing Pointers, Assignment through Pointers, Pointers and Arrays.	
	Introduction, creating a Data File, Opening and Closing a Data File, Processing a Data File.	
	Introduction and Use, Macros, Conditional Preprocessors, Header Files	
Text Book/s	*1. Balagurusami E, Programming in ANSIC, New Delhi: Tata Mc Graw Hill, Fourth Edition (2010).*	
Reference Book/s	*1. Sprankle, M&J. Hubbard, Problem solving and programming concepts, 9th Edition. NJ: Prentice Hall, 2012.* *2. Gaddis,T., Starting out with programming logic and design, 3rd Edition. Boston: Addison Wesley 2012.* *3. Venit, S. &E. Drake, Prelude to programming: Concepts and design, 5th Edition. Boston: Addison Wesley, 2011.* *4. R.G.Dromy. How to Solve it by Computer, 3rd Edition, New Delhi: Pearson Education, 2007.* *5. Kanetkar Yashvant P, Let us C, New Delhi: BPB Publications, Seventh Edition (2007).* *6. Kernighan & Richie, The C Programming Language, New Delhi: PHI Publication, Second Edition (2009).*	

In hours			36
L	**T**	**P**	**Credit**
3	0	2	4

Course Code	**CSP503P**						
Course Title	**Database Concepts**						
Course Outcomes	On the completion of the course the student will be able to CO1: To understand the basic concepts and the applications of database systems. CO2: To understand the basic concepts of data models and ER Diagrams. CO3: To understand the relational database design principles and apply normalization for the development of application software's CO4: To Master the basics of SQL and construct queries using SQL.						
Examination Mode	Theory + Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	
Syllabus							**CO Mapping**
Unit 1	An Overview of DBMS (08 Hours)						CO1
	Concept of File Processing Systems and Database Systems Database Administrator and his Responsibilities Physical and Logical Data Independence						
	Three level Architecture of Database System The External Level, Conceptual Level, The Internal Level						
Unit 2	Introduction to Data Models(08 Hours)						CO2
	Entity Relationship Model, Hierarchical Model , Network and Relational Model ,Comparison of Network, Hierarchical and Relational Model						
	Data base design and ER diagrams – ER Model - Entities, Attributes and Entity sets – Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design for University or Enterprise.						
Unit 3	Relational Databases (07 Hours)						CO3
	Introduction , Terms a. Relation b. Tuple c. Attribute d. Cardinality e. Degree f. Domain						
	Keys (a) Super Key (b) Candidate Key (c) Primary Key (d) Foreign Key						
	Relational Algebra Operations (a.) Select (b.) Project (c.) Union (d.) Difference (e.) Intersection (f.) Cartesian Product						
Unit 4	Relational Database Design (05 Hours)						CO3
	Introduction , Anomalies of un normalized database , Normalization , Normal Forms: INF, 2NF, 3NF, BCNF, 4th NF, 5th NF						
	Database Security, Integrity and Control						
Unit 5	SQL (Structured Query Language)(08 Hours)						CO4
	Introduction , History Of SQL , Basic Structure , DDL Commands , DML						

	Commands , DCL Command, Simple Queries , Nested Queries , Aggregate Functions , Clauses	
	Join Methods, Union, Intersection, Minus, Views, Sequences, Indexing, Subquery.	
Practicals	List of experiments: Task 1. Introduction to SQL and installation of SQL Server / Oracle. Task 2. Data Types, Creating Tables, Retrieval of Rows using Select Statement Task 3. Conditional Retrieval of Rows, Alter and Drop Statements. Task 4. Working with Null Values, matching a Pattern from a Table Task 5. Ordering the Result of a Query, Aggregate Functions, Grouping the Result of a Query, Update and Delete Statements. Task 6. Set Operators, Nested Queries Task 7. Joins, Sequences. Task 8. Views, Indexes Task 9. Database Security and Privileges: Grant and Revoke Commands, Commit and Rollback Commands.	
Text Book/s	*1. Data base System Concepts, Silberschatz, Korth, McGraw hill, Sixth Edition.* *2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.*	
Reference Book/s	*1. Fundamentals of Database Systems, Elmasri Navathe Pearson Education.* *2. An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson, Eight Edition for UNIT III* *3. Simplified Approach to DBMS– Kalyani Publishers*	

In hours			36
L	**T**	**P**	**Credit**
3	0	0	3

Course Code	**CSP504P**						
Course Title	**Computer Organization and Architecture**						
Course Outcomes	On the completion of the course the student will be able to CO1: Demonstrate the working of central processing unit and RISC and CISC Architecture. CO2: Describe the operations and language for the register transfer, micro operations and input- output organization. CO3: Understand the organization of memory and memory management hardware. CO4: Elaborate advanced concepts of computer architecture, Parallel Processing, inter-processor communication and synchronization.						
Examination Mode	Theory						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	
Syllabus							**CO Mapping**
Unit 1	**Digital Logic Circuit (08 Hours)**						CO1
•	Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip Flops, Sequential Circuits						
•	**Digital Components** Decoders, Multiplexers, Registers, Shift Registers, Binary Counters						
•	**Data Representation** Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Error Detection Codes						
Unit 2	**Register Transfer and Microoperations (08 Hours)**						CO2
•	Computer Registers, Register Transfer, Bus and Memory Transfers, Arithmetic Microoperations, Logic Microoperations **Addressing Modes** Introduction & different types of Addressing Modes						
•	**BasicComputer Organization and Design** Computer Instructions, Memory-Reference Instructions, Instruction Cycle, Instruction Codes, Instruction Formats (Direct and Indirect Address Instructions, Zero Address, One Address, Two Address and Three Address Instructions), Design of Accumulator Logic.						
Unit 3	**Introduction to Computer Organization (08 Hours)**						CO3
•	Introduction to Computer and CPU Von Neumann Architecture.						

	Memory Organization Memory Hierarchy, Types of Memory **Reduced Instruction Set Computer (RISC)** CISC Characteristics, RISC Characteristics, RISC Instructions	
•	**Microprogrammed Control** Control Memory, Address Sequencing, Microprogram Example, Design of Control Unit	
Unit 4	**Input Output Organization(08 Hours)**	CO4
•	Input output Interface, Memory Mapped I/O; Interrupt Asynchronous Data Transfer: Strobe Control, Handshaking Priority Interrupts: Daisy-Chaining, Parallel Interrupt, Priority Encoder Interrupt Cycle, Types of Interrupt: Program interrupt Priority Interrupts, Direct Memory Access (DMA)	
Text Book/s	*Mano M.M., Computer System Architecture, Delhi: Prentice Hall of India*	
Reference Book/s	*1) Mano M.M., Digital Logic and Computer Design, Delhi: Prentice Hall of India.* *2) Hayes, Computer Architecture and Organization, New Delhi: McGraw Hill International Edition.* *3) Tannenbaum A.S., Structured Computer Organization, Delhi: Prentice Hall of India* *4) Brey B, The Intel Microprocessors, New Delhi: Pearson Education.* *5) Sloan M.E, Computer Hardware and Organization, 2nd Edition, New Delhi: Galgotia, Pvt. Ltd* *6)Hennessy, John L., and Patterson, David A. Computer Architecture: A Quantitative Approach. India, Elsevier Science, 2017.*	

In hours			36
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CSP505P**						
Course Title	**Information Systems**						
Course Outcomes	CO 1: To inculcate students with comprehensive knowledge of information system and information technology for the use in business. CO 2: To provide knowledge on systems design, development and implementation. CO 3: To enable students understand the role of information system in managerial decision making. CO 4: To apply specific knowledge of information system in functional areas of business.						
Examination Mode	Theory						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	
Syllabus							**CO Mapping**
Unit 1	**Introduction**						CO1
•	Fundamental Aspects of Information, Capturing of Information, Converting Information to Computer – Readable Form, Source of Information, On–Line Information Access and Capture						
•	Basic Systems Concepts, Elements (Components) of System, Characteristics of System, Types of Systems, System Approach.						
•	Information Systems: Definition & Characteristics, Types of Information, Role Of Information in Decision - Making, Levels of Management						
•	Introduction to Different Kinds Of Information Systems: ESS, EIS, DSS, MIS, KWS, TPS, OAS And EDP.						
Unit 2	**Information Systems**						CO2
•	Categories of Information Systems, Development Life Cycle of Information System						
•	Technologies For Information System: Latest Trends In Hardware and Software						
	An overview of Management Information System						
•	Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy Of Management Activity						
•	Structured Vs Unstructured Decisions, Formal Vs. Informal Systems, Pitfalls In MIS Development						
Unit 3	**Simon's Model of Decision**						CO3
•	Making. DSS: Concept, Characteristics And Components, Gorry&Scott Morton Grid, Introduction to GDSS						

Unit 4	**Various types of information systems**	CO4
•	Transaction Processing Systems, Office Automation Systems, MIS and Decision Support System	
•	**Functional MIS**	
	A Study of Marketing, Personnel, Financial and Production MIS	
	Case studies of the Information System	
	Accounting Information Systems, Inventory Control Systems & Marketing Systems.	
Text Book/s		
Reference Book/s	1. *LaudonK.C.,Management Information Systems, Pearson 11th Ed, 2009.* 2. *Murdick, Robert G., & Ross, Joel E., &Claggett, James R, Information Systems for Modern Management, Third Edition, PHI, 1971.* 3. *Kanter, J, Management Information Systems, PHI, 3rd Ed, 1983.* 4. *Goyal, D.P, Management Information Systems, Macmillan, 3rd Ed, 2006.* 5. *Oz, Effy, Management Information Systems, Cengage Learning, 2007.*	

In hours			36
L	**T**	**P**	**Credit**
0	0	4	2

Course Code	**CSP506P**						
Course Title	**Workshop on App Development**						
Course Outcomes	**CO1: Discuss android history, versions, installation and different development tools.** **CO2: Describe UI Widgets and Activity, Intent and Fragment.** **CO3: Introduce android Menu and Layout Manager.** **CO4: Understand android service and data storage, and SQLite, XML & JSON** **CO5: Learn content provider fundamentals and multimedia.**						
Examination Mode	Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	-	10%	-	-	-	-	

Syllabus		**CO Mapping**
Unit 1	Introduction and its Significance	CO1
•	What is Android, History of Android, Importance of Java Language for Android apps, other mobile OS-es, Android versions and different development tools.	
•	Installing software's and Setup Eclipse	
•	**UI Widgets and Activity, Intent & Fragment**	
•	Working with Button,Toast, CustomToast, Button, Toggle Button, SwitchButton, Image Button, CheckBox, Alert Dialog, Spinner, AutoCompleteTextView, RatingBar, DatePicker, TimePicker, ProgressBar, Quick Contact Budge, Analog Clock and Digital Clock Working with hardware Button File Download.	
Unit 2	**Android Menu and Layout Manager**	CO2
•	Option Menu , Context Menu and Popup Menu, Relative Layout, Linear Layout, Table Layout and Grid Layout	
•	**Android Service and Data storage**	
	Android Service, Android Service API,Android Started Service, Android Bound Service,Android Service Life Cycle and Android Service Example	
•	Shared Preferences Internal Storage and External Storage	
Unit 3	**SQLite, XML & JSON**	CO3
•	SQLite API, SQLite Spinner and SQLite List View	
•	XML Parsing SAX, XML Parsing DO, XML Pull Parser and JSON Parsing	
Unit 4	**Content Provider and Multimedia**	CO4
•	Content Provider Fundamental, Notification API, Creating Notification Builder, Playing Audio, Location API, Working with Camera, Motion Sensor, Android P2P Communication and Android Google Map	

Text Book/s		
Reference Book/s	1. *Os Swift, "Android App Development & Programming Guide: Learn in a Day", CreateSpace Independent Publishing Platform (October 2, 2015).* 2. *David Griffiths and Dawn Griffiths, "Head First Android Development: A BrainFriendly Guide", Shroff (1 January 2015).* 3. *Ted Hagos "Learn Android Studio 3 with Kotlin: Efficient Android App Development", Apress media LLC, Newyork, 2018* 4. *Zigurd Mednieks, G. Blake Meike, Laird Dornin, Masumi Nakamura, "Programming Android: Java Programming for the New Generation of Mobile Devices", 2nd Edition, Kindle Edition, O'Reilly Media; 2 edition (28 September 2012).*	

Course Title: Office Automation Laboratory Course
Code: CSP501P

L	T	P	Credits	Marks
0	0	2	1	50

- Working of DOS internal & external commands.
- Learning to use MS WORD, MS EXCEL.
- Using MS PowerPoint to make slides and presentations.
- Introduction to the Database Window, Database Objects, Database Terminology
- Creating a Database using MS Access, Basic Tables
- Using Queries, Using the Auto Form Feature Form Design
- Using the Auto Report Feature, Report Design
- Copying Data, Freezing Columns
- Printing Tables, Printing Reports
- Sorting Records, Using the Filter Sorts, Renaming Columns

Course Title: C Programming Laboratory
Course Code: CSP502P

L	T	P	Credits	Marks
0	0	2	1	50

- Implementation of C programming concepts
- Control Structures, Loops, Arrays, Strings
- Functions, Structures, Union, Files, etc.

In hours			
L	**T**	**P**	**Credit**
3	0	2	4

Course Code	**CSP507P**						
Course Title	**Web Designing**						
Course Outcomes	On the completion of the course the student will be able to CO1: Introduce the creation of static webpages using HTML CO2: Using PHP for back-end manipulations, arrays and functions. CO3: Working with PHP forms and manipulating files. CO4: Publishing web sites.						
Examination Mode	Theory/ Practical/ Theory + Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	5%
Syllabus							**CO Mapping**
Unit 1	**Introduction to Web Development &HTML/DHTML**						CO1
•	Website, Webpage, Static Website, Dynamic Website.						
•	HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes, Headings, Paragraphs, Formatting, Links, Images, Tables, Lists, Forms, Frames, Where to put Tables, Lists, Images, Forms.						
•	CSS in DHTML, Implementation of Web Pages using CSS						CO2
Unit 2	**Introduction to PHP**						
•	Introduction to PHP, PHP Environment, Syntax Overview, Variable Types.						
•	Decision Making, Control Statements, Arrays, Strings, Functions and Objects						
Unit 3	**PHP forms and manipulating files and Connectivity**						CO3
•	Working with Forms, Web Concepts, GET & POST, Maintaining Cookies and Sessions						
•	Working with Files, Opening, closing, coping, renaming and deleting a file, File uploading and downloading, Generating and creating Images with PHP						
•	Database Connectivity with MySQL, performing basic operations (insert, delete, update, select).						
Unit 4	**Purchasing a Domain Name & Web Space**						CO4
•	Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free),						
•	Uploading the Website to Remote Server.						
Reference Book/s	1. Powell Thomas, *HTML & CSS: The Complete Reference*, New Delhi: Mc Graw-Hill, Fifth Edition (2010).						

	2. Andy Harris, *HTML, XHTML and CSS Al l in One For Dummies,* Delhi: Willey, Second Edition (2010). 3. Lerdorf Rasmus,Tatroe Kevin, Mac In tyre Peter, *Programming PHP*, Delhi: O' Reilly Media**,**2013. 4. Ullman Larry, *PHP for the World Wide Web, Visual Quick Start Guide*. New Delhi: Peachpit Press, fourth edition (2011)	

In hours			36
L	**T**	**P**	**Credit**
3	0	2	4

Course Code	**CSP508P**						
Course Title	**Computer Networks**						
Course Outcomes	On the completion of the course the student will be able to CO1: Interaction with different hardware devices present in computer networks and discuss various network models. CO2: Interaction with data link layer and its protocols. CO3: Interaction various Routing algorithms. In addition to that functionality of network layer. CO4: Functionality of Transport layer and Implementation of Application layer protocols in real-world scenarios.						
Examination Mode	Theory + Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/ PBL
Weightage	10%	10%	25%	-	50%	-	

Syllabus		**CO Mapping**
Unit 1	**Introduction to Data Communication (08 Hours)**	CO1
•	Components of Data Communication, Data Representation Transmission Impairments, Switching, Modulation, Multiplexing **Review of Network Hardware:** LAN, MAN, WAN Wireless networks, Internetworks **Review of Network Software:** Layer, Protocols, Interfaces and Services **Review of Reference Models:** OSI, TCP/IP and their comparison **Physical Layer** **Transmission Media**: Twisted pair, Coaxial cable, Fibre optics, Wireless transmission (Radio, Microwave, Infrared)	
Unit 2	**Data Link Layer (08 Hours)**	CO2
•	• Error Correction and Detection • Framing, Noiseless Channels and Noisy Channels • Multiple Access Protocol (ALOHA, CSMA, CSMA/CD, CSMA/CA) • Wired LANs	
Unit 3	**Network Layer (08 Hours)**	CO3
•	• Logical Addressing, Internet Protocol IPv4 and IPv6 • Design Issues, Routing Algorithms (Shortest Path, Flooding, Distance Vector, Hierarchical, Broadcast, Multicast) • Internetworking, IP Protocol, ARP, RARP.	

Unit 4	**Transport Layer (08 Hours)**	CO4
•	• Flow Control, Buffering • Internet Transport Protocol (TCP and UDP) • Congestion Control Algorithms (Leaky bucket, Token bucket, Load shedding)	
	Application Layer • Domain name system, Email, File transfer protocol • HTTP, HTTPS, World Wide Web.	
Practical:	**List of Experiment:** Task 1. Specifications of latest desktops and laptops. Task 2. Familiarization with Networking Components and devices: LAN Adapters, Hubs, Switches, Routers etc. Task 3. Familiarization with Transmission media and Tools: Co-axial cable, UTP Cable, Crimping Tool, Connectors etc. Task 4. Preparing straight and cross cables. Task 5. Study of various LAN topologies and their creation using network devices, cables and computers. Task 6. Configuration of TCP/IP Protocols in Windows and Linux. Task 7. Implementation of file and printer sharing. Task 8. Designing and implementing Class A, B, C Networks Task 9. Subnet planning and its implementation Task 10. Installation of ftp server and client	
Text Book/s	*Tanenbaum. Andrew S. , Computer Networks, 4th Edition, New Delhi: PHI, 2013.*	
Reference Book/s	• *Forouzan B. A., Data Communications and Networking, Fourth Edition, New Delhi: Tata McGraw Hill, 2003.* • *Stalling W, Data & Computer Communications, New Delhi: PHI, Ninth Edition 2010.* • *Scott, Russell. Computer Networking: This Book Includes: Computer Networking for Beginners and Beginners Guide (All in One). N.p., Russell Scott, 2021.*	

L	T	P	Credits
4	0	0	4

Course Code	**CSP509P**
Course Title	Operating Systems
Course Outcomes	CO1-To understanding CPU Scheduling, Synchronization, Deadlock Handling and CO2-Comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems. CO3To describe the role of paging, segmentation and virtual memory in operating systems. CO4-To defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling Algorithms.
Examination Mode	Theory+ Practical

Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	

Syllabus		**CO Mapping**
Unit 1	**Introduction to Operating System (15 Hours)**	CO1
	• OS, History of OS, Types of OS • Functions/operations of OS, User services/jobs, system calls • Traps, architectures for operating systems	
	Process Management • Process overview, Process states • Interrupt mechanism	
Unit 2	**CPU Scheduling and Process Synchronization(18 hours)**	CO2
	Scheduling algorithms Pre-emptive scheduling & Non-Pre-emptive scheduling Levels of schedulers Process Synchronization, Critical section and mutual exclusion problem Classical synchronization problems, Multithreading.	
	System Deadlock Deadlock characterization, Deadlock prevention and avoidance Deadlock detection and recovery, practical considerations	
Unit 3	**Storage Management (15 Hours)**	**CO3**

	• Storage allocation methods: Single contiguous allocation, Multiple contiguous allocation	
	Memory Management • Paging, Segmentation combination of Paging and Segmentation • Virtual memory concepts, Demand Paging, Page replacement Algorithms • Thrashing. Address Protection, • Cache memory, hierarchy of memory types, associative memory.	
Unit 4	**File Management (12 Hours)**	**CO4**
	• Overview of File Management System • Disk Space Management, Directory Structures • Protection Domains, Access Control Lists, Protection Models Queue management, File and directory systems	
	Device Management • Goals of I/O software, Design of device drivers, Device scheduling policies • FCFS, SSTF,SCAN,CSCAN, LOOK, CLOOK	
Text Book/s	1. Galvin and Silberschatz A., *Operating System Concepts*, Eigth Addition, New York: J. Wiley & Sons, 2009.	
Reference Book/s	1. Crowley, *Operating Systems: A Design Oriented Approach*, New Delhi: Tata McGraw Hill, 2008. 2. DonovanJ.J,*SystemsProgramming*,NewYork:McGraw Hill, 1972. 3. Dhamdhere.D.M,*SystemProgrammingandOperatingSystems*,NewDelhi:Tata McGraw Hill, 1999. 4. MadnickandDonovan,*OperatingSystem*,New York:McGrawHill,1978. 5. Beck LelandL.,*SystemSoftware*,Delhi:PearsonEducation,2000. 6. HensonP.B.,*OperatingSystemPrinciples*,Delhi:PrenticeHall 7. TenenbaumA.S.,*OperatingSystem:DesignandImplementation*,NewDelhi:PHI, 2013. 8. Silberschatz, Abraham, et al. Operating System Concepts. United Kingdom, Wiley, 2021.	

In hours			
L	**T**	**P**	**Credit**
3	0	2	4

Course Code	**CSP510P**						
Course Title	**Object Oriented Programming using C++**						
Course Outcomes	On the completion of the course the student will be able to CO1: Discuss the concepts of OOPs. Comparison with the previously developed languages. CO2: Developing the concepts of Classes and object by using real-world examples. CO3: Implement the concepts of Friend function and Inheritance. CO4: Developing the programs using the concept of virtual function and using the concept of file handling. CO5: Interaction with the IDE and help in understanding the concept of OOPs.						
Examination Mode	Theory/ Practical/ Theory + Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	5%
Syllabus							**CO Mapping**
Unit 1	**Introduction to OOPS & Class Concepts**						CO1,5
•	Evolution Of OOP, OOP Features of C++, Characteristics of Object-Oriented Language – Objects, Classes, Inheritance, Reusability, User Defined Data Types, Polymorphism, Overloading, Comparison of C with C++.						
•	Class and Objects, Inline Functions, Static Data, Members and Member Functions, Constructors and Destructors.						
•	Dynamic Objects, Array of Pointers to Object, Pass by Value Vs. Pass by Reference, Local and Global Class, Nested and Empty Class, Pre-processor Directives, Namespace.						
Unit 2	**Console I/O &Operator Overloading**						CO2
•	Hierarchy of Console Stream Classes, Unformatted and Formatted I/O Operations, Manipulators						
•	Overloadable Operators, Overloading-Unary and Binary, Arithmetic and Relational Operators, Overloading Subscript, Array, Insertion, Extraction, New and Delete Operators.						
Unit 3	**Friend Function and Type Conversion & Inheritance**						CO3
•	Friend Function, Function Overloading, Overloading Operators through Friend Function						
•	Basic Type Conversion, Conversion Between Objects and Basic Types, Conversion Between Objects of Different Classes						
•	Derivation Rules, Different Forms of Inheritance, Roles of Constructors and						

	Destructors in Inheritance	
Unit 4	**Virtual Functions & File Handling**	CO4
•	Virtual Functions and Their Needs, Pure Virtual Function, Virtual Destructor, Virtual Derivation, Abstract Class.	
•	Hierarchy of File Stream Classes, Opening and Closing Files.	
•	File Modes, Testing for Errors, File Pointers and Their Manipulations, ASCII & Binary Files, Sequential and Random-Access Files	
Text Book/s	1. Balaguruswami E, *Object Oriented Programming In C++*, New Delhi: Tata Mc Graw Hill,2006	
Reference Book/s	1. Stroustrup Bjarne, *The C++ Programming Language*, New Delhi: Addison-Wesley Professional,2000 2. Lafore Robert, *Object Oriented Programming in C++*. Delhi: Sams Publishing, 2000 3. Lippman,Tom Weiss, *C++ Primer*, New Delhi: Addison Wesley, 2005 4. Scildt Herbert, *C++ The Complete Reference*, New Delhi: Tata Mc Graw Hill, 2007	

Semester 2

In hours			36
L	**T**	**P**	**Credit**
3	0	2	4

Course Code	**CSP511P**						
Course Title	**Data Structure**						
Course Outcomes	On the completion of the course the student will be able to CO1: Student will be able to handle operation like searching, insertion, deletion, traversing on various Data Structures; CO2: Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort; CO3: Students will be able to choose appropriate Data Structure as applied to specific problem definition; CO4: Implement Various searching algorithms and become familiar with their design methods.						
Examination Mode	Theory and Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	
Syllabus							**CO Mapping**
Unit 1	**Introduction (08 Hours)**						CO1
•	Primitive and Composite Various Data Structures ,Common Operations on Data Structures, Algorithm Complexity, Time-Space Tradeoff Between Algorithms, Complexity of Algorithms						
•	**String**: Strings as ADTs, Representation and Manipulation, String Operations.						
•	**Arrays** Arrays Defined, Representing Arrays in Memory, Various Operations on Linear Arrays. Bubble Sort. Linear Search, Binary Search Records, Matrices, Sparse Matrices						
Unit 2	**Linked Lists, Stacks, Queues (08 Hours)**						CO2
•	Types of Linked Lists, Representing Linked Lists in Memory, traversing a linked List, Searching in a linked list, Memory Allocation and Garbage Collection, Insertion and deletion in a linked list. Circular Linked List. Advantage of Using Linked Lists Over Arrays, Various Operation on Linked Lists						
•	**Stacks** Description of Stack Structure, Implementation of Stack Using Arrays and Linked Lists, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms.						

	QuickSort	
Unit 3	**Queues,Trees, Graphs, Heaps (08 Hours)**	CO3
•	**Queues** Implementation of Queue Using Linked Lists , Circular Queues, De-Queues, Priority Queues.	
•	**Trees** Description of Tree Structure and Its Terminology, Binary Tree, representation in memory, Traversing Binary Trees, Traversal Algorithms using Stacks.	
•	**Graphs** Representation of Graphs and Applications: Adjacency Matrix, Path Matrix Warshall's Algorithm, Linked Representation of a Graph Traversing a Graph: DFS and BFS, Spanning Trees. **Heaps** Description of Heap Structure, Implementing Heaps Using Arrays	
Unit 4	**Searching and Sorting Algorithms (08 Hours)**	**CO4**
•	Linear Search, Binary Search Insertion Sort, Selection Sort, Bubble Sort, radix Sort, Merge Sort, Quick Sort	
	Files Operations on Files, Types of Files **File Organizations**: Sequential Files, Indexed Sequential File, Directed Files and Multikey Files	
Practical:	**List of Experiment:** Task 1: Write a program to insert a new element at end as well as at a given position in an array. Task 2: Write a program to delete an element from a given array whose value is given or whose position is given. Task 3: Write a program to find the location of a given element using Linear Search. Task 4: Write a program to find the location of a given element using Binary Search. Task 5: Write a menu driven program to perform following insertion operations in a single linked list: i. Insertion at beginning ii. Insertion at end iii. Insertion after a given node iv. Traversing a linked list Task 6: Write a program to implement push and pop operations on a stack using linear array. Task 7: Write a program to convert an infix expression to a postfix expression using stacks. Task 8: Write a program to evaluate a postfix expression using stacks. Task 9: Program to sort an array of integers in ascending order using bubble sort. Task 10: Program to sort an array of integers in ascending order using selection sort Task 11: Program to traverse graphs using BFS. Task 12: Program to traverse graphs using DFS.	
Text Book/s	"Data Structures with C (Schaum's Outline Series)", Seymour Lipschutz, 1st edition, McGraw Hill Education	
Reference Book/s	1) "Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Sahni, Computer Science Press.	

	2) Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company. 3) "Classic Data Structures", Samanta and Debasis, 2nd edition, PHI publishers. 4) Karumanchi, Narasimha. Data Structures and Algorithms Made Easy: To All My Readers : Concepts, Problems, Interview Questions. India, CareerMonk Publications, 2016.	

L	T	P	Credits
3	0	0	3

Course Code	**CSP512P**						
Course Title	**Software Engineering**						
Course Outcomes	CO1: Decompose the given project in various phases of a lifecycle. Choose appropriate process model depending on the user requirements. CO2: Perform various life cycle activities like analysis, design, implementation, testing and maintenance. Know various processes used in all the phases of the product. CO3: Apply the knowledge, techniques, and skills in the development of a software product. CO4: Explain project management techniques.						
Examination Mode	Theory and Practical						
Assessment Tools	Written Quiz	Assignment/ Project Work	MSE	MTP	ESE	EPR	ABL/PBL
Weightage	10%	10%	25%	-	50%	-	
Syllabus							**CO Mapping**
Unit 1	**Software Engineering Principles:**						CO1
•	How is Software Engineering an Engineering Discipline						
•	Information System Characteristics, Software Development Process Models,						
•	Life Cycle Concepts, Software Phases and Deliverables, Software Development Strategies						
•	**Arrays** Arrays Defined, Representing Arrays in Memory, Various Operations on Linear Arrays. Bubble Sort. Linear Search, Binary Search Records, Matrices, Sparse Matrices						
Unit 2	**Technical Development:**						CO2
•	Structured Systems Analysis and Design Requirements						
•	Collection And Specification, Data Flow and Logical Data Modeling, Cost Benefit Analysis,						
•	Feasibility Study, Architectural And Detailed Design, Process, Data, Network, Control						
Unit 3	**Software Project Management:**						CO3
•	Principles Of Software Project Management Organizational and Team Structure						
•	Project Planning, Project Initiation and Project Termination; Technical						
•	Quality And Management Plans, Project Controls, Cost Estimation Methods-Function Points and COCOMO, Tools						
•	Software Quality Management: Quality Control, Quality Assurance, Quality Standards						
Unit 4	**Software Development Method & CASE:**						**CO4**

	• Formal, Semi-Formal and Informal Methods; Data Function, and Event-Based Modeling, Some of The Popular Methodologies Such as Yourdon's SAD, SSADM Etc.	
•	• CASE Tools, CASE Standards	
	• Implementation: In 3GL Environment, In 4GL Environment, In Client-Server Environments, Coding Styles.	
Text Book/s		
Reference Book/s	1. *Pressman R. S., Software Engineering: A practitioner's Approach, McGraw Hill, SeventhEdition 2010.* 2. *PankajJalote, An Integrated Approach to Software Engineering, Pearson 2010.* 3. *Sommerville I., Software Engineering, Addison –Pearson, Eighth Edition 2009*	

Course Title: Web Designing Laboratory
Course Code: CSP507P

L	T	P	Credits
0	0	2	1

• Web designing using HTML, DHTML, CSS, and PHP.

Course Title: Object Oriented Programming Structures Laboratory
Course Code: CSP510P

L	T	P	Credits
0	0	2	1

• Implementation of OOP concepts using C++
• Write program in 'C++' language

• Using input and output statements
• Using control statements.
• Using functions.
• Using array
• Using Classes and implementation of Constructor and Destructor.
• Using files.
• Using OOP's Concepts (Inheritance, Polymorphism, Encapsulation, Friend and Static Functions, Exception Handling)