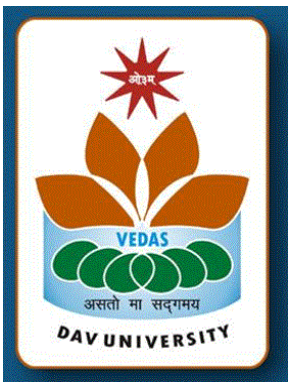
DAV UNIVERSITY, JALANDHAR

FACULTY OF SCIENCE



Course Scheme & Syllabus
For
Bachelor of Computer Applications (Hons.)
Specialization in
Cyber Security

(As per NEP-2020)
Batch-2023 &onwards

(As per Choice Based Credit System)
1st TO 8thSEMESTER

Batch: 2023

DAV UNIVERSITY, JALANDHAR

Introductory Note of the Programme

The BCA program is designed to equip you with the knowledge and skills necessary to thrive in the rapidly evolving field of information technology. Over the course of this program, you will explore various aspects of computer science, including programming languages, database management, software development, networking, web development, and much more. Our curriculum is carefully crafted to strike a balance between theoretical knowledge and practical application, ensuring that you not only grasp the fundamental concepts but also gain hands-on experience in solving real-world problems.

Throughout this program, you will delve into the fundamentals of Cyber Security, including topics such as network security, cryptography, ethical hacking, risk management, incident response, and digital forensics. You will learn how to identify vulnerabilities, implement preventive measures, and respond effectively to security incidents, ensuring the integrity, confidentiality, and availability of digital information.

Program Educational Objectives (PEOs)

PEO-1. Work productively as successful Computer professionals in diverse career paths including supportive and leadership roles on multidisciplinary teams or be active in higher studies.

PEO-2. Communicate effectively, recognize and incorporate societal needs and constraints in their professional endeavours, and practice their profession with high regard to ethical responsibilities.

PEO-3. Engage in life-long learning and to remain current in their profession to foster personal and organizational growth.

Programme Outcomes (POs)

PO-1: Apply mathematics and computing fundamental and domain concepts to find out the solution of defined problems and requirements. (Computational Knowledge)

PO-2: Use fundamental principle of Mathematics and Computing to identify, formulate research literature for solving complex problems, reaching appropriate solutions. (Problem Analysis)

PO-3: Understand to design, analyze and develop solutions and evaluate system components or processes to meet specific need for local, regional and global public health, societal, cultural, and environmental systems. (Design/Development of Solutions)

PO-4: Use expertise research-based knowledge and methods including skills for analysis and development of information to reach valid conclusions. (Conduct Investigations of Complex Computing Problems)

PO-5: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. (Modern tool usage)

PO-6: Exhibiting ethics for regulations, responsibilities and norms in professional computing practices. (Professional Ethics)

PO-7: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development (Environment and sustainability).

PO-8: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice (Ethics).

PO-9: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings (Individual and team work).

PO-10: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions (Communication).

PO-11: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments (Project management and finance).

PO-12: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change (Life-long learning).

Program Specific Objectives (PSOs)

PSO-1: To explore technical comprehension in varied areas of Computer Applications and experience a conducive environment in cultivating skills for thriving career and higher studies.

PSO-2: To comprehend, explore and build up computer programs in the allied areas like Algorithms, System Software, Multimedia, Web Design and Data Analytics for efficient design of computer-based systems of varying complexity.

Mapping of POs with PEOs

PEOs→ / POs↓	PEO 1	PEO 2	PEO 3
PO1	Yes	Yes	Yes
PO2			Yes
PO3	Yes		Yes
PO4		Yes	
PO5		Yes	
PO6			Yes
PO7	Yes		Yes
PO8			
PO9		Yes	
PO10	Yes		Yes
PO11		Yes	
PO12	Yes	Yes	

Mapping of PSO with PEO

PEOs→ / PSO↓	PEO 1	PEO 2	PEO 3
PSO1	Yes	---------	Yes
PSO2	---------	Yes	Yes

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Scheme of Courses
Bachelor of Computer Applications

Credit Details			
S.No.	**Course Category**	**Course Category Abbreviation**	**3-Yr B.C.A… (Credits)**
1.1	Discipline Specific Courses-Core	DSC	52
1.2	Discipline Specific-Skill Enhancement Courses-Core	DS-SEC	09
1.3	Discipline Specific-Value Added Courses-Core	DS-VAC	
Total of Discipline Specific Core Courses			
2.1	Minor Courses	MC	20
OR			
2.2	Interdisciplinary Courses	IDC	04
3	Multidisciplinary Courses	MDC	09
4	Ability Enhancement Course- Common	AEC-C	08
5	Value Added Courses-Common	VAC-C	06
6.1	Skill Enhancement Courses- Common	SEC-C	08
6.2	Skill Enhancement Courses-Summer Internship	SEC-SI	04
Total of Skill Enhancement Courses			
Total Credits			**120**

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Scheme of Courses
Bachelor of Computer Applications

Credit Details				
S.No.	**Course Category**	**Course Category Abbreviation**	**4-Yr B.C.A. (Hons.)/.. (Credits)**	**4-Yr B.C.A. (Hons/.. (Hons. with Res.) (Credits)**
1.1	Discipline Specific Courses-Core	DSC	84	72
1.2	Discipline Specific-Skill Enhancement Courses-Core	DS-SEC	09	09
1.3	Discipline Specific-Value Added Courses-Core	DS-VAC		
	Total of Discipline Specific Core Courses			
2.1	Minor Courses	MC	28	28
OR				
2.2	Interdisciplinary Courses	IDC	04	04
3	Multidisciplinary Courses	MDC	09	09
4	Ability Enhancement Course-Common	AEC-C	08	08
5	Value Added Courses-Common	VAC-C	06	06
6.1	Skill Enhancement Courses-Common	SEC-C	08	08
6.2	Skill Enhancement Courses-Summer Internship	SEC-SI	04	04
6.3	Skill Enhancement Courses-Research Project/Dissertation	SEC-RP	--	12
Total of Skill Enhancement Courses				
Total Credits			**160**	**160**

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Semester 1

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP101	Principles of Digital Electronics	DSC	3	0	0	3
2	CSP102	Computer Fundamentals and Office Automation	DS-SEC	2	0	2	3
3	CSP103	Algorithm Design and Programming Using C	DSC	3	0	2	4
4	XXXX	Multi-Disciplinary Course	MDC	3	0	0	3
5	XXXX	Ability-Enhancement Course	AEC-C	2	0	0	2
6	XXXX	Skill-Enhancement Course (common)	SEC-C	2	0	0	2
7	XXXX	Value-added Course	VAC-C	3	0	0	3
	Total						**20**

L- Lectures T- Tutorial P- Practical Cr.- Credits

Semester 2

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP104	Object Oriented Programming using C++	DSC	3	0	2	4
2	CSP105	Web Designing	DS-SEC	1	0	2	2
3	CSP106	Mathematical Foundation of Computer Science	DSC	3	0	0	3
4	XXXX	Multi -Disciplinary Course	MDC	3	0	0	2
5	XXXX	Ability-Enhancement Course	AEC-C	2	0	0	2
6	XXXX	Skill-Enhancement Course (common)	SEC-C	3	0	0	3
7	XXXX	Value-added Course	VAC-C	2	1	0	3
	Total						**20**

L- Lectures T- Tutorial P- Practical Cr.- Credits

FIRST EXIT:

The students will be awarded "Undergraduate Certificate in Computer Science & Applications" after exit at this point, provided they secure 4 Credits in skill/work-based vocational courses or internship/apprenticeship for 4-6 weeks (with minimum 120 hours) during summer term.

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Semester 3

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP201	Computer Oriented Numerical and Statistical Techniques	IDC	4	0	0	4
2	CSP202	Object Oriented Programming using Java	DSC	3	0	2	4
3	CSP203	Database Concepts	DSC	3	0	2	4
4	XXXX	Multi -Disciplinary Course	MDC	3	0	0	3
5	XXXXX	Ability-Enhancement Course	AEC-C	2	0	0	2
6	XXXX	Skill-Enhancement Course (common)	SEC-C	3	0	0	3
	Total						**20**

L- Lectures T- Tutorial P- Practical Cr.- Credits

Semester 4

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP204	Data Structures	DSC	3	0	2	**4**
2	CSP205	Computer Graphics	MC	3	0	2	**4**
3	CSP206	Operating Systems	DSC	3	0	0	**3**
4	CSP207	Computer Organization and Architecture	DSC	3	0	0	**3**
5	CSP208	Computer Networks	DSC	3	0	2	**4**
6	XXXX	Ability-Enhancement Course	AEC-C	2	0	0	2
	Total						**20**
NCC credits are only earned by those students who are opted NCC							
7	NCC201	NCC Organization and National Integration	**VAC**	2	0	0	**2**
8	NCC202	Training: Drill, Map Reading, Field And Battle Craft	**VAC**	0	0	2	**1**
	Total						**23**

L- Lectures T- Tutorial P- Practical Cr.- Credits

SECOND EXIT:

The student will be awarded "Undergraduate Diploma in Computer Science & Applications" after exit at this point provided that he/she secure 4 Credits in skill/work based vocational courses or internship/apprenticeship for 4 – 6 weeks (with minimum 120 hours) offered during first year summer term or second year summer term.

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Semester 5

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP301	Skill-Enhancement Course	**SEC-SI**	0	0		**4**
2	CSP302	Programming in Python	DSC	3	0	2	**4**
3	----------	----------	**DS-SEC**	3	0	2	**4**
4	CSP303	Web Engineering using ASP.NET	**MC**	3	0	2	**4**
5	**CSP304**	Cyber Security	**MC**	4	0	0	**4**
	Total						**20**
NCC credits are only earned by those students who are opted NCC							
7	NCC301	NCC Organization and National Integration	**VAC**	2	0	0	**2**
8	NCC302	Training: Drill, Map Reading, Field and Battle Craft	**VAC**	0	0	2	**1**
	Total						**23**

L- Lectures T- Tutorial P- Practical Cr.- Credits

DS-SEC (Discipline Specific-Skill Enhancement Course-Core)-(Choose One)

S.No	Paper Code	Course Title	L	T	P	Cr
1	CSP307	Data Warehousing and Mining	3	0	2	4
2	CSP308	Data Analytics	3	0	2	4
3	CSP309	Big Data	3	0	2	4

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Semester 6

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP310	Design and Analysis of Algorithm	DSC	3	0	0	3
2	CSP311	Artificial Intelligence	DSC	3	0	0	3
3	CSP312	Software Engineering	DSC	3	0	0	3
4	CSP313	Mobile Application Development	DSC	3	0	2	4
5	CSP314	Discrete Mathematics	DSC	3	0	0	3
6	--------	----------	**MC**	4	0	0	4
	Total						**20**

L- Lectures T- Tutorial P- Practical Cr.- Credits

MC (MINOR COURSE)- (Choose One)

S.No	Paper Code	Course Title	L	T	P	Cr
1	CSP315	Digital Image Processing	3	0	2	4
2	CSP316	R Programming	3	0	2	4
3	CSP317	Machine Learning	3	0	2	4

Note: If the Student get CGPA>= 7.5 then He / She will have to submit the Research Project with 12 Credit.

THIRD EXIT:
The student will be awarded "Bachelors in Computer Science & Applications" degree after exit at this point.

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Semester 7

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP421	IT Systems Security & Physical Security	**DSC**	3	0	2	4
2	CSP422	IT Application & Data Security	**DSC**	3	0	2	4
3	CSP423	Digital Forensics I	**DSC**	3	0	2	4
4	CSP424	IT Network Security	**DSC**	3	0	2	4
5	CSP401	Research Methodology	**MC**	4	0	0	4
	Total						**20**

L- Lectures T- Tutorial P- Practical Cr.- Credits

Semester 8

S.No	Paper Code	Course Title	Course Category	L	T	P	Cr
1	CSP425*	Digital Forensics II	**DSC**	3	0	0	**3**
2	CSP426*	Information Security Governance	**DSC**	3	0	0	**3**
3	CSP410*	Major Project	----------	0	0	12	**6**
4	CSP412	Cryptography and Network Security	**MC**	3	0	2	**4**
5	CSP420	Cloud Computing Security & Management	**DSC**	4	0	0	**4**
	Total						**20**

- ***Those students are adopting the research project they are exempted these courses. (12 credit)

S.No	Paper Code	Course Title	Course Category, Discipline Specific Elective (DSE)	L	T	P	Cr
1	CSP415	Research Project	----------	0	0	24	**12**
	Total						**12**

L- Lectures T- Tutorial P- Practical Cr.- Credits

FOURTH EXIT:

The student will be awarded "Bachelor of Computer Science and Applications (Hons.) Specialization in Cyber Security" degree after exit at this point.

List of Multi-disciplinary open elective courses at DAV University

Sr. No.	Course Name	Faculty/Department
1	Basics of Physics	Physics
2	Basics of Chemistry	Chemistry
3	Basics of Biology	Zoology & Botany
4	Introductory Biotechnology	Biotechnology
5	Introductory Microbiology	Microbiology
6	Functioning of the Human Body	Zoology
7	Introductory Botany	Botany
8	Business Management for Beginners	CBME
9	Fundamental of Mutual Funds	CBME
10	Economics for Beginners	CBME
11	Professional Communication	English
12	Fine Arts	Arts, Fine Arts & Performing Arts
13	Jyotish: 'Eye of the Veda'	Vedic Studies
14	Mathematical Statistics	Mathematics
15	Introductory Journalism	JMC
16	Professional Photography	JMC
17	Library Information Sciences	Library Sciences

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Common courses with credits

Ability-Enhancement Courses	**Cr.**	**Skill-Enhancement Courses**	**Cr.**	**Value-Added Courses**	**Cr.**
Personality Enhancement	1L+1P	Essentials of Entrepreneurship-Thinking and Action	2L+1P	Environmental Studies **(Mandatory)**	2L+1P
Personality Development	2P	Design Thinking	2P	Human Values and Ethics **(Mandatory)**	2L+1T
Behavioural & Life Skills	1L+1P	Design Thinking & Innovation	2L	Gender Sensitization	2L
Global Citizenship in Higher Education	2L	Data Analytics	2L+1P	Professional Ethics	2L
Communication Skills **(Mandatory)** **OR** Cambridge English-I **(Mandatory#)** & Cambridge English-II **(Mandatory#)** *# To be offered in two semesters*	1L+1P 1L+1P 1L+1P	Cyber Security	3 (2L+1P)	Sustainable Development	2L
		Digital Fluency	1L+1P	Green Technologies	2L
Health & Yoga	1L+1P	Fundamentals of Computer programming & IT(FCPIT)	2L	General Studies	2L
Technical Report Writing	2L	Python Programming	3 (2L+1P)	NSS	2 (1L+1P)
Leadership Management	2L	Disaster Preparedness and Planning	2L		
Therapeutic Yoga	1L+1P	Intellectual Property Rights	2L		
Creative & Critical Thinking	1L+1P	Apiculture	2P		
Community Engagement & Social Responsibility **(Mandatory)**	1L+1P	NCC*	3 (2L+1P)		

		LATEX	3 (1L+2P)		
		Programming with FORTRAN	3(2L+1P)		

Notes:

a. Due to the constraint on total number of credits to be restricted under 160 for four year UG programmes, the mandatory courses which may or may not fall under ability-enhancement, skill-enhancement (common) or value-added courses can be offered as non-credit course and the student will have to qualify (as Satisfactory/Unsatisfactory) these courses to secure minimum passing marks through the process of assessment as mandated by DAV University.

b. Minimum number of students feasible to run a common course (Ability-enhancement, Skill-enhancement (common) and Value-added) will be 20 students.

c. *Pre-requisite to opt NCC is that the student must be in possession of Certificate B or has appeared in B-certificate exam of NCC. NCC course shall run in two semesters of 3 credits (2L+1P) in each semester. Student who wishes to opt for NCC is required to study in two semesters of total 6 credits

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Semester 1

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

Course Code	**CSP101**						
Course Title	**Principles of Digital Electronics**						
Course Outcomes	On the completion of the course the student will be able to CO1: To provide the knowledge about the various electronics components and digital circuits to the students and designing of various building blocks of computer system concepts. CO2: To introduce the basic concepts and laws involved in the Boolean algebra and logic families and digital circuits. CO3: To familiarize with the different number systems, logic gates, and combinational and sequential circuits utilized in the different digital circuits and systems. CO4: To design and analysis of the digital circuit and system. After studying this subject, students will be able to easily understand the internal working of digital electronic circuits.						
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 Digital Electronics & Number System**						CO 1
•	Definitions of Digital Signals, Digital Waveform, Digital Logic, Gate propagation delay time, Digital Operations, Digital Integrated Circuits, Digital IC signal levels.						
•	Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Conversion from One Number System to another, Arithmetic Operation without Changing the Base,1"s Complement and 2"s Complement.						
•	Logic Gates**:** AND, OR, NOT, NAND, NOR, XOR, XNOR, NAND & NOR as Universal Gates, Logic Gates Applications.						
Unit 2	**Boolean Algebra & Combinational Circuits**						CO 2
•	Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates, K Maps, Simplification of Boolean Expression using K Maps.						
•	Half Adder& Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/ Subtractor.						
Unit 3	**Combinational& Sequential Logic Circuits**						CO 3
•	Multiplexers & De-multiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer						
•	Encoders & Decoders.						
•	Latch, Flip Flops RS Flip Flop, JK Flip Flop, Master Slave JK Flip Flop						

	Race Condition, Removing Race Condition, D Flip Flop, T Flip Flop, Applications of Flip Flops	
Unit 4	**Semiconductor& Memories**	CO 4
•	Introduction, Static and dynamic devices, read only & random access memory chips, PROMS and EPROMS Address selection logic.	
•	Read and write control timing diagrams for ICs.	
Reference Book/s	1. Malvino, Digital Computer Electronics, Delhi: Mc Graw Hill, Second Edition. 2. Mano D. Morris, Digital Logic & Computer Design, New Delhi: PHI Second Edition 3. Halkias Millman, Integrated Electronics, Delhi: Mc Graw Hill. 4. Hodges D.A. & Jackson H.G., Analysis and Design of Integrated Circuits, New York: International Mc Graw Hill,1983. 5. Ujjenbeck, John, Digital Electronics: A Modern Approach, New Delhi: Prentice Hall,1994	

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

Course Code	**CSP102**						
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 Computer son 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, nonimpact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer, plotters.						
•	Machine language, assembly language, higher level language, 4GL and introduction to Compiler, Interpreter, Assembler.						
•	Batch, multi programming, timesharing, multi process or 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*. New Delhi: BPB First Edition, 2002. 2. Norton Peter, *Introduction to Computers*, Mc Graw 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 Mc Graw-Hill,1989 7. Cyganski D, Orr J A, *Information Technology Inside and Outside*, New Jersey USA: Pearson Education 2002.	

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

Course Code	**CSP103**						
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 problems solving (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 Multi-dimensional 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).	

Course Title: Office Automation Laboratory
Course Code: CSP102

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: CSP103

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.

DAV UNIVERSITY, JALANDHAR

Semester - 2

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

Course Code	**CSP104**						
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, Preprocessor 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. Balagurusami 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	

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

Course Code	**CSP105**						
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 All 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)	

Course Title: Web Designing Laboratory

Course Code: CSP105

L	T	P	Credits	Marks
0	0	2	1	50

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

Course Title: Object Oriented Programming Structures Laboratory
Course Code: CSP104

L	T	P	Credits	Marks
0	0	2	1	50

- 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)