

B.Sc. Computer Science (Ancillary)

About the Course

Technology is defined as the application of scientific knowledge for practical purposes. The radical changes in technologies and their ever increasing adaptation to newer areas of application, demand frequent updation of the academic curriculum so that the students can rise to the expectation of the Industry.

The knowledge acquired by the students will also equip them to meet the industrial need, and get suitable employment.

Course Objectives

The B.Sc. Computer Science (Ancillary) course is designed with the following objectives.

- a) To develop skills in software and hardware so as to enable the graduates to apply them in their respective field.
- b) To Train & Equip the students to meet the requirement of the Industrial standards.

Student Learning Outcomes

The Computer Science Curriculum is designed so that each student will have demonstrated the following competencies:

- a) Ability to apply knowledge of computing appropriate to the discipline.
- b) Ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- c) Ability to use current techniques, skills, and tools necessary for computing practice.

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SEM	PAPER CODE	SECTION	MARKS	TOPIC
1	CS 21012	Theory (A)	35	Computer Fundamentals
		Theory (B)	35	Principles of Programming Language
		Practical	30	Programming in 'C' and Basic Linux Commands
2	CS 22022	Theory (A)	35	Introduction to Operating Systems and Computer Organization
		Theory (B)	35	Database Systems
		Practical	30	DBMS and GUI Design lab
3	CS 23032	Theory (A)	35	Web technologies & Multimedia
		Theory (B)	35	Object Oriented Programming concepts
		Practical	30	OOP Lab

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Paper Code: CS21012

CS21012	Section A: Computer Fundamentals	Marks: 35
Sl. No.	Topics	No. of Periods
1.	Introduction to Computers: History of Computers	1
2.	Hardware: CPU, Primary and Secondary storage, I/O devices, Bus structure Computer Peripherals: VDU, Keyboard, Mouse, Printer	6
3.	Software: System and Application.	2
4.	Number systems and Codes: Number representation: Binary, Octal, Hexadecimal, Binary Coded Decimal (BCD), Conversion of bases. Complement notations, Binary Arithmetic, Binary Codes: Alphanumeric, ASCII, EBCDIC	6
5.	Boolean Algebra: Fundamentals of Boolean algebra, Basic Gates (AND, OR, NOT), Universal Gates (NAND, NOR), XOR, XNOR, Truth Tables corresponding to Boolean functions.	5
6.	Introduction to Networking: Advantages of Networking; Basic Features, LAN, MAN and WAN; characteristic features. Intranet and Internet; Servers and Clients; Ports; Domain Name Server (DNS); WWW, Browsers. Guided and Unguided media - Dial up, ISDN, ADSN; Cable, Modem; E-mail, Voice and Video Conferencing.	4
	Total:	24
Books and References:		
<ol style="list-style-type: none"> 1. Computer Fundamental- P.K Sinha. 2. Digital Electronics – M.Moris Mano. 3.Introduction to Computer Science-ITL Edution solutions Limited,Pearson Education 		

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CS21012	Section B: Principles of Programming Language	Marks: 35
Sl. No.	Topic	No. of Periods
1.	Introduction to Problem Solving: Concept of data and information: Basic problem solving using Flow chart and Algorithm.	2
2.	Generations of Programming Languages: Machine Language, Assembly Language, Procedural Language, Object Oriented Language.	1
3.	Introduction to C Programming Language: Features and Structure of a C Program, Character Set, Identifiers and Keywords, Variables and Constants, Brief Idea about C Library.	2
4.	Data Types in C: Primitive, User-Defined, Enumerated, Type Casting, Declaration.	1
5.	Operators in C: Different Types, Precedence and Associativity, Expressions using Operators.	1
6.	Input-Output Operations: Standard Functions with Escape Sequences and Format Specifiers.	1
7.	Decision Making Statement: if-else, switch-case, Ternary Operator.	2
8.	Iterative Statements: for, while and do-while with control statements like break and continue.	2
9.	Functions: Declaration, Calling and Definition, Idea about Recursive Function.	2
10.	Scope of Variables: Local and Global.	1
11.	Storage Classes: auto, extern, register, static.	1
12.	Array: Declaration and Use-Both 1-D and 2-D, Idea about String, Passing Array to a Function.	2
13.	Pointer: A Brief Idea about Declaration and Use, Passing Pointer to a Function-Idea of Call-By-Value and Call-By-Address.	2
14.	Structure and Union: Declaration and Use.	1
15.	Macro: Different Types, Declaration and Use.	1
16.	File Handling: Basic input and output operations on a disk file, sequential and random file access.	2
	Total:	24

Books and References:

1. Balagurusamy – Programming in ANSI C – TMH Publications
2. Kanetkar – Let Us C – BPB Publications

CS31511	Practical	Marks: 30	Programming in 'C' and Basic Linux Commands	LAB
Lab experiments will be related to topics covered in the theory paper CS 21012, Group B.				

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Paper Code: CS22022

CS22022	Section A: Introduction to Operating Systems and Computer Organization	Marks: 35
Sl. No.	Topics	No. of Periods
1.	Instruction: Operation Code and Operand, Addressing modes, Stack organization.	4
2.	Memory: Types of Memory. Memory Hierarchy: CPU Register. Cache Memory, Primary Memory, Secondary Memory. Virtual Memory: Paging, Segmentation (Introduction only), Replacement Strategies (Optimal, FIFO, LRU).	4
3.	I/O organization and interfacing: Polling, Interrupts, DMA, I/O Bus.	4
4.	Introduction to operating systems: Functions of OS, OS Evolution & Types: Batch Processing, multi-programming, time-sharing. Single User, Multi User, Multi Tasking	4
5.	Processes and scheduling: Job/process concepts. Scheduling basics: CPU-I/O interleaving, Scheduling algorithms: Pre-emptive vs. non Pre-emptive, FCFS, SJF, SRTF, priority scheduling, round robin.	4
6.	Memory management: Processes in memory. Logical addresses. Partitions: static <i>versus</i> dynamic (MFT, MVT). Deadlock and Concurrency: Introduction.	4
	Total:	24
Books and References:		
<ol style="list-style-type: none"> 1. Computer Fundamental- P.K Sinha. 2. Digital Electronics – M.Moris Mano. 3.Introduction to Computer Science-ITL Education solutions Limited Pearson Edition 		

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CS22022	Section B: Database Systems	Marks: 35
Sl. No.	Topic	No. of Periods
1	Overview: Files and database. Data independence, 3-level DBMS architecture. Data dictionary. Database languages	4
2	Relational Model: Definition and properties: ER Diagram: Normalization (up to BCNF)	4
3	Relational Algebra: Basic Operations and their examples	4
4	Query language: Introduction to SQL - basic concepts.	5
5	Introduction to Transaction processing ACID Properties. Single user Vs Multi user systems: Read and Write operations, Need of Concurrency Control and Recovery Management.	7
	Total:	24
Books and References:		
<ol style="list-style-type: none"> 1. Database System Concepts- Abraham Silberschatz, Henry Korth, S. Sudarshan McGraw-Hill. 2. An introduction to Database Systems by, C.J.Date, Narosa Publications 3. Fundamentals of database systems by Elmasri.Navathe, Addison Wesley 		

CS 22022	Practical	Marks: 30	Hardware Lab II	LAB
Lab experiments will be related to topics covered in the corresponding theory paper CS 22022, Group B.				

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Paper Code: CS23032

CS23032	Section A: Web technologies and Multimedia	Marks: 35
Sl. No.	Topics	No. of Periods
1.	Web pages – types and issues, Comparison of different technologies (eg. Microsoft, Sun-Micro systems etc).	2
2.	WWW- basic concepts, web-client & web-server, application server	4
3.	http protocol(frame format), Universal resource locator (URL)	4
4.	HTML-different tags, sections, images & pictures, listings, tables, frames and forms.	6
5.	Multimedia- Basic concepts, Different forms of multimedia-text, audio, image & video.	4
6.	Sound- types, computer representation of sound & sampling. Examples of audio tools (Sound forge, etc.).	2
7.	Animations – Tweening, Morphing in multimedia with examples.	2
	Total:	24
Books and References: 1. Internet Technology and Web Design, ISRD Group, McGrawHill Education 2. HTML: A Beginner's Guide 5/E, Wendy Willard, , McGrawHill Education 3. Principles of Multimedia, Ranjan Parekh, McGrawHill Education 4. Fundamentals Of Computer Graphics And Multimedia, Mukherjee, D. P., PHI		

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CS23032	Section B: Object Oriented Programming Concepts	Marks: 35
Sl. No.	Topic	No. of Periods
1	Introduction – A look at procedure-oriented programming, Basic concepts of Object Oriented Programming, benefits of OOP, Object-Oriented Languages	2
2	Beginning with C++ - Structure of C++ programs, keywords, data types (basic and user-defined), declaration, initialization, concepts of class and objects, reference variables, operators, scope resolution operators.	2
3	Functions in C++ - Call by reference, return by reference, inline functions, default arguments, function overloading	2
4	Classes and Objects – Defining member functions, private, public members, static data members, friend functions	3
5	Constructors and destructors – Parameterized constructors, constructors with default arguments, dynamic initialization, copy constructor, destructors	4
6	Operator Overloading – Overloading unary, binary operators	3
7	Inheritance – different types of inheritance, Virtual base classes, abstract classes	3
8	Polymorphism – Pointers to objects (base and derived), virtual functions, pure virtual functions	3
9	Overview of some advanced topics – Templates, exception handling	2
	Total:	24

Books:

1. Object-Oriented Programming with C++, E Balaguruswamy, Tata McGraw_Hill.
2. Object-Oriented Programming in C++, Robert Lafore, Galgotia.

CS 23032	Practical	Marks: 30	OOP Lab	LAB
Lab experiments will be related to topics covered in the theory paper CS 23032, Group A				