

# Debra Thana Sahid Kshudiram Smriti Mahavidyalaya



PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF  
BACHELOR OF SCIENCE (HONOURS)  
MAJOR IN COMPUTER SCIENCE  
4-YEAR UNDERGRADUATE PROGRAMME  
(w.e.f. Academic Year 2024-2025)

Based on

Curriculum & Credit Framework for Undergraduate Programs  
(CCFUP), 2023 & NEP, 2020

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks				
								CA	ESE	TOTAL		
B.Sc. in Physical Sc./ Math. & Comp. Sc. with Computer Science	1 <sup>st</sup>	I	<b>SEMESTER-I</b>									
			Major (Disc.-A1)	CSGMJ101	<b>T: Introduction to Computers</b> <i>(To be studied by the students taken Computer Science as Discipline-A)</i>	4	3-1-0	15	60	75		
			SEC	SEC101	<i>To be chosen from SEC-01 of Discipline A/B/C of their Hons. prog.</i>	3	0-0-3	10	40	50		
			AEC	AEC101	Communicative English-1 ( <i>common for all programmes</i> )	2	2-0-0	10	40	50		
			MDC	MDC101	Multidisciplinary Course-1 ( <i>to be chosen from the list</i> )	3	3-0-0	10	40	50		
			VAC	VAC101	VAC-01: ENVS ( <i>common for all programmes</i> )	4	2-0-2	50	50	100		
			Minor (Disc.-C1)	CSG MN 01/C1	<b>T: Computer Fundamental</b> <b>P: Office Automation (Using M.S Office)</b> <i>(To be studied by the students taken Computer Science as Discipline-C)</i>	4	3-0-1	15	60	75		
			<b>Semester-I Total</b>						20			
		II	<b>SEMESTER-II</b>									
			Major (Disc.-B1)	CSGMJ201	<b>T: Introduction to Programming in C</b> <b>P: Programming in C Lab</b> <i>(Same as like AI for students taken Computer Science as Discipline-B)</i>	4	3-0-1	15	60	75		
			SEC	SEC201	<i>To be chosen from SEC-02 of Discipline A/B/C of their Hons. prog.</i>	3	0-0-3	10	40	50		
			AEC	AEC201	MIL-1 ( <i>common for all programmes</i> )	2	2-0-0	10	40	50		
			MDC	MDC201	Multi-Disciplinary Course-02 ( <i>to be chosen from the list</i> )	3	3-0-0	10	40	50		
			VAC	VAC201	VAC-02 ( <i>to be chosen from the list</i> )	4	4-0-0	10	40	50		
			Minor (Disc.-C2)	CSG MN 02/C2	<b>T: Introduction to Programming in C</b> <b>P: Programming in C Lab</b> <i>(To be studied by the students taken Computer Science as Discipline-C)</i>	4	3-0-1	15	60	75		
			Summer Intern.	CS	Community Service	4	0-0-4	-	-	50		
		<b>Semester-II Total</b>						24				400
		<b>TOTAL of YEAR-1</b>						44	-	-	-	800

MJ= Major Programme (Multidisciplinary), MN = Minor, A/B = Choice of Major Discipline; C= Choice of Minor Discipline; SEC = Skill Enhancement Course, AEC = Ability Enhancement Course, MDC = Multidisciplinary Course, VAC = Value Added Course; CA= Continuous Assessment, ESE= End Semester Examination, T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical, MIL = Modern Indian Language, ENVS = Environmental Studies

## (Multidisciplinary Studies)

### MAJOR

#### **MJ A1: Introduction to Computers**

**Credits 04 (FM: 75)**

#### **Course Objectives:**

- Understand the fundamental concepts and characteristics of computers, including their generation and classification.
- Comprehend the basic components of a digital computer, including CPU, ALU, CU, Register set, and memory hierarchy.
- Gain knowledge of communication pathways, input/output devices, and the primary, secondary, cache, and virtual memory.
- Demonstrate proficiency in number systems, including binary, decimal, octal, and hexadecimal, along with arithmetic operations and complement notation.
- Understand data communication principles, components, and modes, as well as the basics of computer networks, network topologies, and types.
- Familiarize themselves with operating systems, their functions, classification, and the concepts of multi-programming, multi-tasking, and multi-processing.
- Gain insights into the booting process and the role of assembler, loader, linker, and interpreter in program execution.

#### **Course Outline:**

#### **Introduction to Computers: (60 Lectures)**

##### **1. Introduction: (8 Lectures)**

- Definition of computers.
- Classifications of Computers (Micro, Mini, Mainframe, Supercomputers).
- Software/Hardware concepts.
- Terminology (Bit, Byte, Word, Nibble, Computer Languages).

## **2. Basic Components of Computer: (12 Lectures)**

- Computer organization (CPU, CU, ALU, Register set, Communication Pathway, Input/output Devices, Memory Module).
- Understand CPU components: Control Unit (CU), Arithmetic Logic Unit (ALU), and Register set.
- Explore Communication Pathway: Bus, Internal & External Bus, Control, Address & Data Bus.
- Examine Input devices (Keyboard, Pointing devices) and Output devices (Soft copy, hard copy devices).
- Memory Hierarchy: Primary Memory, Secondary Memory, Cache Memory, Virtual Memory.

## **3. Number System: (15 Lectures)**

- Cover Binary, Decimal, Octal, Hexadecimal systems and interconversion.
- Explore Binary-Decimal-Octal Hexadecimal arithmetic, signed & unsigned numbers.
- Learn Complement notation ( $r$ 's &  $(r-1)$ 's complement), Addition & Subtraction using complement notation.
- Dive into Floating-point representation, Computer codes (Weighted binary, Non-weighted binary, Alphanumeric), BCD addition, Gray to Binary & Binary to Gray conversion.

## **4. Data Communication and Computer Network: (15 Lectures)**

- Define data communication, examine characteristics, and components.
- Explore modes, media (guided & unguided) for data transmission.
- Understand Channel capacity, delve into Computer Network concepts (Network topology, Types of networks).
- Explore network devices (Hub, Repeater, Switch, Bridge, Router, Gateway).
- Gain basic understanding of e-mail, Search engines, Chatting, Internet conferencing, and Intranet.

## **5. Operating System: (10 Lectures)**

- Define Operating System (OS), understand functions, necessity, classification (CUI & GUI, Single-user, Multi-user).
- Explore concepts: Multi-Programming, Multi-Tasking, Multi-Processing, Booting Process.
- Understand basics of Assembler, Loader, Linker, and Interpreter.

### **Suggested Readings:**

1. **Sinha, P. K., & Sinha, P. (2017). "Computer Fundamentals: Concepts, Systems & Applications." BPB Publications.**
2. **Rajaraman, V. (2017). "Fundamentals of Computers.," PHI Learning.**
3. **Prakash, S. (2019). "Computer Fundamentals and Programming in C." Laxmi Publications.**
4. **Pradhan, S. (2017). , " Computer Fundamentals: Architecture and Organization." Oxford University Press.**

5. Bharadwaj, A. S. (2017)., ” Computer Fundamentals and Applications.” Wiley India.
6. Deo, N. (2017). ,”Fundamentals of Computers.”, Dreamtech Press.
7. Acharya, S., & Kamath, M. V. (2017). ,”Computer Fundamentals.”, Prentice

**MJ B1: Same as Minor-1 (CSMN101) of Computer Science (Hons) programme  
Credits 04**

**Full Marks: 75**

**MINOR (MI)**

**MN-1/C1: Same as Minor-1 (CSMN101) of Computer Science (Hons) programme  
Credits 04**

**Full Marks: 75**

**MN-2/C2: Same as Minor-2 (CSMN201) of Computer Science (Hons) programme  
Credits 04**

**Full Marks: 75**

**SKILL ENHANCEMENT COURSE (SEC)**

**TO BE CHOSEN FROM THE BUCKET OF SECs OF SELECTED DISCIPLINE A/B/C  
(As per A/B/C Hons. Prog. Syllabus)**