

**Under-Graduate Programme in Bachelor of
Science (B.Sc.) (Computer Science) /
Bachelor of Arts (B.A.) (Computer Applications) /
B.Sc. (Physical Science with Computer Science)**

Scheme And Syllabus

(NEP-2020)

**Effective from
Academic Session 2025-2026**

Abbreviations Used:

L	Lectures
T	Tutorials
P	Practical
C	Credits
H	Hours
EE	External Examinations
IA	Internal Assessment
CO	Course Outcomes
UG	Undergraduate
DSC	Discipline Specific Course
AEC	Ability Enhancement Course
VAC	Value Added Course
MC	Minor Course
SEC	Skill Enhancement Course
I/A/P/C	Internship/Apprenticeship/Project/Community Outreach

List of the Multidisciplinary Courses (MDC) – 3 Credits offered by Department of Computer Science for 1st Year

S.No.	Semester	MDC Code	Title	L	T	P	C
1	I	COMP-1001	Computer Fundamentals	3	0	0	3
2	II	COMP-1002	Introduction to Emerging Trends in Information Technology	3	0	0	3

Computer Fundamentals

COMP-1001

Max Marks: 75

Credit (Theory) 3

45 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Understand the fundamental concepts of computer systems, including hardware components, processor architecture, and their functionalities.
- CO2** Gain knowledge of different types of memory, storage devices, input, and output peripherals used in modern computing.
- CO3** Explore various types of software, operating systems, file systems, and their role in managing computer resources.
- CO4** Develop a foundational understanding of programming languages and their applications in software development.

SECTION-I

Introduction to Computers and Components: Characteristics and Evolution of Computers, Generations of Computers; Types of Computers: Microcomputers, Minicomputers, Mainframe Computers, Supercomputers; Basic Components of a Computer System: Input Unit, Output Unit, ALU, Control Unit, CPU; Instruction Set, Registers, Processor Speed, Types of Processors (Intel, AMD, ARM, RISC, CISC).

SECTION-II

Memory, Storage, and Peripherals: Memory: RAM (DRAM, SRAM), ROM, EPROM, EEPROM, Cache Memory, Virtual Memory; Secondary Storage: HDD, SSD, Optical Storage (CD, DVD, Blu-ray), USB Flash Drives, SD Cards; Input Devices: Keyboard, Mouse, Touch Screens, Joystick, Stylus, Scanners (OCR, OMR, MICR, Bar Code Reader), Biometric Devices, Digital Cameras; Output Devices: Monitors (LCD, LED, OLED), Printers (Inkjet, Laser, 3D), Plotters, Projectors.

SECTION-III

Software and Operating Systems: Software Types: System Software (Operating Systems, Utility Programs), Application Software (Word Processors, Spreadsheets, DBMS); Operating Systems: Windows, Linux, macOS, Android, iOS, Basics of Cloud-Based OS and Virtual Machines; File Systems: FAT32, NTFS, ext4, APFS; Introduction to Programming Languages: Low-Level (Machine Language, Assembly), High-Level (C, Java, Python, JavaScript, SQL), Basics of Fourth-Generation Languages (4GL)

Text book:

1. Pradeep K. Sinha, Priti Sinha, “Computer Fundamentals”. BPB Publications.

Reference book:

1. Rajaraman, V., “Fundamental of Computers”. Prentice Hall India, New Delhi.

Note: There will be 4 Parts (A, B, C, D) and the examiner shall set 7 questions in total from all the Sections/Blocks (I, II, III) of the syllabus in total.

- Part A will have 2 questions of 12 marks each from Section/Block I of the syllabus and students have to attempt any one.
- Part B will have 2 questions of 12 marks each from Section/Block II of the syllabus and students have to attempt any one.
- Part C will have 2 questions of 12 marks each from Section/Block III of the syllabus and students have to attempt any one.
- Part D will have 10 short answer questions of 2 marks each from all the three Sections/Blocks (I, II, III) of the syllabus and the students shall have to attempt 7 in total.

Introduction to Emerging Trends in Information Technology

COMP-1002

Max Marks: 75

Credit (Theory) 3

45 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Understand and analyze the latest IT trends and their applications.
- CO2** Evaluate the impact of emerging technologies on industries.
- CO3** Identify potential risks and ethical concerns in IT advancements.
- CO4** Stay updated with evolving IT innovations for future career opportunities.

SECTION-I

Introduction to Emerging IT Trends: Definition and Importance of Emerging Technologies; Evolution of IT Trends Over the Years; Impact of Emerging Technologies on Business and Society.

Artificial Intelligence & Machine Learning: AI vs. Machine Learning vs. Deep Learning; Applications of AI in Different Industries (Healthcare, Finance, Education); Ethics & Challenges in AI Development.

SECTION-II

Cloud Computing & Edge Computing: Basics of Cloud Computing (IaaS, PaaS, SaaS); Edge Computing vs. Cloud Computing; Benefits and Future of Cloud & Edge Technologies.

Internet of Things (IoT) & Smart Technologies: Introduction to IoT and its Architecture; Real-World Applications of IoT (Smart Homes, Smart Cities, Healthcare); Security & Privacy Concerns in IoT.

SECTION-III

Cybersecurity & Data Privacy: Emerging Cyber Threats & Cybersecurity Challenges; Role of AI in Cybersecurity; Global Data Privacy Laws (GDPR, CCPA, India's Data Protection Act).

Future Trends in IT: Quantum Computing: Concepts & Potential Applications; Digital Twin Technology & Metaverse; Green Computing & Sustainable IT Practices.

Text & Reference Book:

1. Subhashree Bhattacharjee, "Artificial Intelligence for students", Shroff publishers and Distributors Pvt. Ltd., 2016.
2. Stuart Russell, Peter Norvig, "Artificial intelligence a modern approach (4th edition), Pearson, 2021.
3. Avantika Yadav, "Cyber security", Narosa Publishing House Pvt. Ltd., 2017.
4. Rajkumar buyya, James Broberg, Andrzej Goscinski, "Cloud computing principles and paradigms", Wiley, 2011.
5. Dr. Kamlesh Lakhwani, Dr. Hemant Kumar Gianey, Joseph Kofi Wireko, Kamalkant Hiran, "Internet of Things (IoT) principles paradigms and applications of IoT", BPB Publications, 2020.

Note: There will be 4 Parts (A, B, C, D) and the examiner shall set 7 questions in total from all the Sections/Blocks (I, II, III) of the syllabus in total.

- Part A will have 2 questions of 12 marks each from Section/Block I of the syllabus and students have to attempt any one.

- Part B will have 2 questions of 12 marks each from Section/Block II of the syllabus and students have to attempt any one.
- Part C will have 2 questions of 12 marks each from Section/Block III of the syllabus and students have to attempt any one.
- Part D will have 10 short answer questions of 2 marks each from all the three Sections/Blocks (I, II, III) of the syllabus and the students shall have to attempt 7 in total.