

# **Bachelor of Computer Applications (BCA)**

## **SKILL COURSES**

### **BCA (Data Science)**

*Four Year Undergraduate Programme*

*As per NEP 2020 guidelines*

*Under Choice based Credit System*

**FOR THE STUDENTS TO BE ADMITTED IN THE SESSIONS  
2025-26, 2026-27, 2027-28**

## BCA (Data Science) – FIRST SEMESTER

Course: Skill Enhancement Course (SEC)  
Course Credits: (L-P-T)  
(1-2-0)  
Total marks: 75

Course Title: PC Software: Installation and Troubleshooting  
Course Code: USECST111  
Practical Evaluation: 50 Marks  
End Semester Examination: 25 Marks of 2 hours duration

*For examinations to be held in Dec 2025, 2026 and 2027*

### Course objectives & learning outcomes:

1. To provide knowledge about the PC Hardware.
2. To brief about different utilities and PC settings.
3. To develop the ability to configure, setup and troubleshoot PC.

### UNIT -I

Introduction to PC Hardware: Study of basic I/O systems, Types of Memories- Static RAM and Dynamic RAM, ROM, PROM, EPROM, EEPROM, External Storage Devices, CPU (Central Processing Unit)- ALU and control, Motherboard and Processor :Types of Processor, System performance Monitoring. 10 Hours

### UNIT -II

BIOS Configuration: Study of BIOS Set-up- Advance set-up, Boot configuration, Boot Menu, Installation of Operating System (Windows), Control panel, Installation and uninstallation of application software, Setting System Date and Time, Hard Disk: Formatting of Hard disk, Partitioning of Hard disk in different logical drives, Defragmenting Hard disk using defrag, Scan Disk for checking disk space, Disk clean up, Scan disk, Installation of Device Drivers: Different types of Motherboard drivers: Network, Audio, and Graphics, Modem. Display Settings: Resolution, Themes, multiple displays, Projector Set up. 10 Hours

### UNIT-III

Configuration of External devices: Physical set-up of Printers- Performing test print out, Printing of document etc, Scanner set-up, Webcam, Bluetooth device, Memory card reader, Diagnostic and troubleshooting of PC: POST (Power on Self Test), Maintenance of PC, Error messages, Task Manager. Concept of compression Compression Utilities: WinZip, PKZIP, files recovery, Antivirus, CD/DVD Writing Software, Concept of Virtual drives and Image files (ISO). 10 Hours

### Suggested readings/ references:

1. Mark Minasi, "The complete PC Upgrade & Maintenance Guide", BPB Publications.
2. D Balasubramanian, "Computer Installation and Servicing", Tata McGraw Hill Education.
3. Robert C. Brenner, "Trouble Shooting and Repair Guide", BPB Publications.
4. Scott Mueller, "Upgrading and Repairing PC's", PHI Publications, Fourth Edition.
5. Adane Nega Tarekegn, "A Simple Guide to Computer Maintenance and Troubleshooting", LAP LAMBERT Academic Publishing.
6. James Karney, "Upgrade & Maintain Your PC", M & T Books; 2nd edition.

**BCA (Data Science) – FIRST SEMESTER**

Course: Skill Enhancement Course (SEC)  
Course Credits: (L-P-T)  
(1-2-0)  
Total marks: 75

Course Title: PC Software: Installation and Troubleshooting  
Course Code: USECST111  
Practical Evaluation: 50 Marks  
End Semester Examination: 25 Marks of 2 hours duration

*For examinations to be held in Dec 2025, 2026 and 2027*

**NOTE FOR PAPER SETTERS FOR EXAMINATIONS -**

The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

**Section A**

Total of Four (4) short answer questions covering all three units with atleast one question from each unit shall be set. The candidates are required to attempt all questions. Each question shall be of 2½ Marks.

(4x 2½ = 10 marks)

**Section B**

Total of Six (6) long answer questions, selecting two questions from each unit with internal choice shall be set. The candidates are required to attempt three questions selecting one from each unit. Each question shall be of 5 Marks.

(3 x 5 = 15 marks)

**Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.**

**Practical Evaluation**

Daily evaluation of practical's/Viva voce etc.

10 marks

**Final Examination**

40 Marks

**Pattern for practical examination**

Practical file	5 Marks
Written examination	20 Marks
Viva-Voce	15 Marks
Total	40 Marks

**BCA (Data Science) - SECOND SEMESTER**

Course: Skill Enhancement Course (SEC)  
Course Credits: (L-P-T)  
(1-2-0)  
Total marks: 75

Course Title: Cyber Security  
Course Code: USECST211  
Practical Evaluation: 50 Marks  
End Semester Examination: 25 Marks of 2 hours duration

*For examinations to be held in May 2026, 2027 and 2028*

**Course objectives & learning outcomes:**

1. To provide knowledge about the PC Hardware.
2. To brief about different utilities and PC settings.
3. To develop the ability to configure, setup and troubleshoot PC.

**UNIT –I**

Cyberspace, Architecture of cyberspace, Internet, World Wide Web, Advent of internet, Internet infrastructure for data transfer and governance, Internets ociety, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.

Classification of cyber crimes, Common cyber crimes-cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks.

10 Hours

**UNIT -II**

Cybercriminals modus-operandi, Reporting of cyber crimes, Remedial and mitigation measures, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences, Organizations dealing with Cyber crime and Cyber security in India.

Introduction to Social networks, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media.

10 Hours

**UNIT-III**

Definition of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E-Commerce security best practices.

Introduction to digital payments, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in authorized banking transactions

10 Hours

**Suggested readings/ references:**

1. R. C Mishra, "Cyber Crime Impact in the New Millennium", Auther Press Edition.
2. Sumit Belapure and Nina Godbole, "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley India Pvt. Ltd.
3. Henry A. Oliver, "Security in the Digital Age: Social Media Security Threats and Vulnerabilities", Pearson.
4. Elias M. Awad, "Electronic Commerce", Prentice Hall of India Pvt Ltd.
5. Kumar K, "Cyber Laws: Intellectual Property & E-Commerce Security", Dominant Publishers.
6. Eric Cole, Ronald Krutz, James W. Conley, "Network Security Bible", 2nd Edition, Wiley India Pvt. Ltd.
7. E. Maiwald, "Fundamentals of Network Security", McGraw Hill.

**BCA (Data Science) - SECOND SEMESTER**

Course: Skill Enhancement Course (SEC)  
Course Credits: (L-P-T)  
(1-2-0)  
Total marks: 75

Course Title: Cyber Security  
Course Code: USECST211  
Practical Evaluation: 50 Marks  
End Semester Examination: 25 Marks of 2 hours duration

*For examinations to be held in May 2026, 2027 and 2028*

**NOTE FOR PAPER SETTERS FOR EXAMINATIONS -**

The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

**Section A**

Total of Four (4) short answer questions covering all three units with atleast one question from each unit shall be set. The candidates are required to attempt all questions. Each question shall be of 2½ Marks.

(4x 2½ = 10 marks)

**Section B**

Total of Six (6) long answer questions, selecting two questions from each unit with internal choice shall be set. The candidates are required to attempt three questions selecting one from each unit. Each question shall be of 5 Marks.

(3 x 5 = 15 marks)

**Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.**

**Practical Evaluation**

Daily evaluation of practical's/Viva voce etc.

10 marks

**Final Examination**

40 Marks

**Pattern for practical examination**

Practical file	5 Marks
Written examination	20 Marks
Viva-Voce	15 Marks
Total	40 Marks

**BCA (Data Science) - THIRD SEMESTER**

Course: Skill Enhancement Course (SEC)  
Course Credits: (L-P-T)  
(1-2-0)  
Total marks: 75

Course Title: System Analysis and Design  
Course Code: USECST311  
Practical Evaluation: 50 Marks  
End Semester Examination: 25 Marks of 2 hours duration

*For examinations to be held in Dec 2026, 2027 and 2028*

**Course objectives & learning outcomes:**

1. To learn the basics of Software and system development life cycle.
2. To learn different SRS and feasibility study.
3. To gain knowledge on DFDs, ER diagrams and tools.

**Unit-1**

Software Systems Analysis and Design Life Cycle: Requirements determination, requirements specifications, feasibility analysis, final specifications, hardware and software study, Software system design, Software system implementation, Software system evaluation, Software system modification.

15 Hours

**Unit-II**

Role of Software systems analyst, tools used in Software system analysis Information gathering: strategies, methods, case study Software system requirements specification: classification of requirements as strategic, tactical, operational and statutory. Feasibility analysis: deciding project goals, examining alternative solutions, cost – benefit analysis.

15 Hours

**Unit-III**

Tools for systems analysts: data flow diagrams, case study for use of DFD, leveling of DFDs, leveling rules, logical and physical DFDs, software tools to create DFDs. Data oriented Software systems design: entity relationship model, E-R diagrams, relationships, cardinality and participation, data base design.

15 Hours

**Suggested Readings:**

1. Software Engineering by Roger S. Pressman- Tata McGraw Hill.
2. Software Project Management by Bob Hughes and Mike Cotterell- Tata McGraw Hill.
3. Software Project Management by S. Kelkar- PHI.
4. Information Technology Project Management by Kathey and Schwalbe Thomson Learning
5. An Integrated Approach to Software Engineering by P. Jalote- PHI.

**BCA (Data Science) - THIRD SEMESTER**

Course: Skill Enhancement Course (SEC)  
Course Credits: (L-P-T)  
(1-2-0)  
Total marks: 75

Course Title: System Analysis and Design  
Course Code: USECST311  
Practical Evaluation: 50 Marks  
End Semester Examination: 25 Marks of 2 hours duration

*For examinations to be held in Dec 2026, 2027 and 2028*

**NOTE FOR PAPER SETTERS FOR EXAMINATIONS -**

The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

**Section A**

Total of Four (4) short answer questions covering all three units with atleast one question from each unit shall be set. The candidates are required to attempt all questions. Each question shall be of 2½ Marks.

(4x 2½ = 10 marks)

**Section B**

Total of Six (6) long answer questions, selecting two questions from each unit with internal choice shall be set. The candidates are required to attempt three questions selecting one from each unit. Each question shall be of 5 Marks.

(3 x 5 = 15 marks)

**Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.**

**Practical Evaluation**

Daily evaluation of practical's/Viva voce etc.

10 marks

**Final Examination**

40 Marks

**Pattern for practical examination**

Practical file	5 Marks
Written examination	20 Marks
Viva-Voce	15 Marks
Total	40 Marks