

SANSKARAM UNIVERSITY

JHAJJAR



Scheme of Examination and Syllabus for BCA(Honors)

**Under Multiple Entry-Exit, Internships and CBCS-LOCF in accordance to NEP 2020
w.e.f. 2024-25**

Objective of the program:

1. Develop a deep understanding of computer science and its applications in real-world contexts, including programming languages, data structures and algorithms, computer networks, databases, and software engineering.
2. Gain practical experience in software development, including designing, implementing, and testing software systems, using various tools and technologies commonly used in the industry.
3. Build critical thinking and problem-solving skills to tackle complex challenges in the field of computer science and develop innovative solutions using cutting-edge technologies.
4. Develop effective communication, collaboration, and teamwork skills to work effectively in a diverse and interdisciplinary environment.
5. Acquire knowledge and skills in emerging areas of computer science such as artificial intelligence, machine learning, computer vision, cybersecurity, and big data analytics to keep up with the rapidly changing technological landscape.

Description of the Programme

The Bachelor of Computer Applications (BCA) Honors program is designed to provide students with a comprehensive understanding of the field of computer science and its applications in various industries. BCA(Honors) program incorporates the recently implemented National Education Policy (NEP) of 2020, which aims to transform the Indian education system and promote holistic development among students.

BCA program is structured to equip students with the necessary knowledge and skills in computer science, programming, software development, and information technology. It offers a blend of theoretical concepts and practical training, enabling students to apply their learning to real-world scenarios.

- The Programme will be of 4 years duration with multiple exit and entry options. Students of this Programme can exit after 1st year with a certificate, after 2nd year with an Advanced Diploma, after 3rd year with a Bachelor's Honors Degree. After 4th year, a student can be awarded with Bachelor's Degree (Honors). Bachelor's Degree (Honors) with Research will be awarded, in case a student secures 75% and above in all semesters.
- Students will be given opportunities for multidisciplinary and interdisciplinary education through options to choose courses of their interests from other schools within the university.
- The total credits for 4-year BCA (Honors) degree, the minimum credits will be 160.
- The relevant multidisciplinary courses are designed to address the learning interests of the students across the schools.

The Programme Highlights

Program Highlights: Bachelor of Computer Applications (BCA) Honors Program

- a. **Discipline-Specific Courses (Core Major Courses):** The BCA program places a strong emphasis on core major courses that form the foundation of computer science and applications. These courses provide in-depth knowledge and understanding of essential subjects such as programming languages, database management, software engineering, web development, data structures, algorithms, and computer networks. Students will engage in 20 core major courses, with each course consisting of 80 hours of instruction.
- b. **Interdisciplinary Minor Courses (IDC):** The BCA program recognizes the importance of interdisciplinary learning and offers students the opportunity to explore other related fields. Through eight interdisciplinary minor courses, students can broaden their horizons and gain insights from areas such as mathematics, statistics, business management, or communication. Each IDC course involves 32 hours of instruction.
- c. **Multidisciplinary Courses (MDC):** To develop a well-rounded skill set, the BCA program includes three multidisciplinary courses. These courses integrate knowledge and concepts from different disciplines, fostering critical thinking and problem-solving abilities. With nine hours of instruction for each MDC course, students gain a broader perspective and a holistic approach to problem-solving.
- d. **Ability Enhancement Courses (AEC):** AEC courses are designed to enhance students' abilities and competencies beyond their core subject knowledge. In the BCA program, students will engage in three AEC courses, which focus on areas such as communication skills, logical reasoning, analytical thinking, and entrepreneurial skills. These courses consist of eight hours of instruction each.
- e. **Skill Enhancement Courses (SEC):** In the rapidly evolving field of computer applications, it is essential for students to acquire industry-relevant skills. The BCA program offers three skill enhancement courses to help students develop specific technical skills in areas such as programming frameworks, software tools, data analytics, or cybersecurity. Each SEC course involves nine hours of instruction.
- f. **Common Value-Added Courses (VAC):** The BCA program recognizes the importance of holistic development and incorporates three common value-added courses. These courses cover topics such as personality development, ethics, sustainability, and social responsibility. By participating in these courses, students cultivate a sense of social consciousness and ethical decision-making. Each VAC course comprises six hours of instruction.

- g. Project and Internship: Practical exposure is a vital component of the BCA program. Students will engage in a comprehensive project and internship module, which spans three units. This module provides hands-on experience and allows students to apply their knowledge and skills in real- world scenarios. The project and internship component consists of 16 weeks, ensuring students gain practical industry experience.
- h. Department Electives (DSE): To cater to individual interests and specialization within the field of computer applications, the BCA program offers four department electives. These elective courses allow students to delve deeper into specific areas of computer science, such as artificial intelligence, mobile app development, cloud computing, or data science. The number of hours of instruction for each DSE course may vary based on the chosen elective.

By incorporating these diverse components into the BCA program, aim to provide students with a well-rounded education, equipping them with the necessary knowledge, skills, and practical experience to excel in the field of computer applications

Four Year BCA (Honors) Programme

The 4-year BCA (Hons) degree will be minimum 160. Following types of courses will be offered for a 4-Year BCA(Hons) Programme:

- 20 Discipline-specific Major Courses (80 credits)
- 8 Interdisciplinary Minor Courses (32 credits)
- 3 Multidisciplinary Courses (9 credits)
- 3 Ability Enhancement Courses (8 credits)
- 3 Skill Enhancement Courses (9 credits)
- 3 Value-added courses (6 credits)
- 1 Internship (2 credits)
- 1 Community Engagement Project (2 credits)
- 1 Research Project with Dissertation (12 credits)

Programme Outcomes (POs):

PO1	Disciplinary Knowledge: Understand the concepts of core subjects and have the hands-on skills to demonstrate competency in the domain of computer science.
PO2	Critical Thinking and Problem Solving: Define, identify, analyze, design, interpret, evaluate, and provide the solution using computer domain knowledge.
PO3	Global/Multicultural Competence: Identify and analyse global demand for computer technologies to provide a solution to all.
PO4	Research Related Skills: Students will develop conceptual clarity and be enabled to analyze a situation and provide sustainable solutions.
PO5	Leadership & Teamwork: The ability to perform effectively as a leader and perform excellently with a variety of teams in a multidisciplinary environment.
PO6	Effective Communication: Ability to communicate effectively with various stakeholders in the field of computer science
PO7	Ethics and Human Values: Perform ethical and professional practice by using computer technology.
PO8	Community Engagement and Social Responsibilities: Help the community and society grow an advanced health system, promote economic growth, and provide a sustainable solution to society.

PROGRAMME STRUCTURE & CREDIT DISTRIBUTION

SEMESTER-WISE DISTRIBUTION OF COURSES AND CREDITS FOR 4 YEARS BCA(Hons.)

1st year

Sl. No	semester	Major (Core)	Minor	Multidisciplinary	Ability Enhancement Course	Skill Enhancement Course	Value Added Course	SIP Dissertation	Total Credit
1 st year	1 st	Computer System Architecture (4 credit)	Mathematical Foundations (4 credit)	Principles of Management (3 credit)	English Communication Skills & Lab (3 credit)	Problem Solving using C & Lab (3 credit)	Health and Wellness (1 credit) Environmental Science (2 credit)	20	20
	2 nd	Data Structure using C & Lab (4 credit)	Probability and Statistics (4 credit)	Cyber Security (3 credit)	Technical Communication & Lab (3 credit)	Object Oriented Programming Using Java & Lab (3 credit)	Indian Knowledge System (IKS) (3 credit)	20	20

2 nd year	3 rd	Computer Network (4 credit)	Operating Systems (4 credit) Web Technology & Lab (4 credit)	Financial Institution & Market (3 credit)	Visual Communication (2 credit)	Database Management Systems & Lab (3 credit)		20	20
	4 th	Data Mining using Python & Lab (4 credit) Optimization Techniques (4 credit) Cloud Computing (4 credit)	Introduction to Artificial Intelligence (4 credit) Software Engineering using UML (4 credit)					20	20
3 rd year	5 th	1. Cloud Computing Management & lab (4 credit) 2. Machine Learning & Lab (4 credit) 3. DSE-I(4 credit) 4. DSE-II (4 credit) 5. Internship (2 credit) 6. Social Responsibility and Community Engagement (2 credit)						20	20
	6 th	Theory of Computation (4 credit) Blockchain Technologies (4 credit) "DSE-III (4 credit) Seminar (2 credit) Project (6 credit)						20	20
		60	24	09	08	09	06	04	120

4 th Year	7 th	<ol style="list-style-type: none"> 1. Research Methodology 2. DSE-IV 3. Cryptography and Network Security 4. Introduction to Big Data (16 credit) 	<ol style="list-style-type: none"> 5. Data Visualization and Interpretation & Lab (4 credit) 					
	8 th	Natural Language Processing (4 credit)	R Programming for Machine Learning* (4 credit)					
		20	08					
							Total Credit	