SCHEME OF EXAMINATION

SYLLABI

for

Bachelor of Computer Applications (BCA)

Scheme and Syllabus (w.e.f. Academic Session 2024-25)

As per UGC Curriculum & Credit Framework for Undergraduate Programme (CCFUP) (Dec 2022)

Offered by

University School of Information, Communication & Technology GGSIPU
at Affiliated Institutions of the University

GURU GOBIND SINGH
INDRAPRASTHA
UNIVERSITY

Guru Gobind Singh Indraprastha University Sector 16C,
Dwarka, Delhi – 110 078 [INDIA]
www.ipu.ac.in

Vision of the School

Create High-Quality Engineering and Computer Application Professionals

Mission of the School

To serve humanity by creating professionally competent, socially sensitive engineers with high ethical values who can work as individuals or in groups in multicultural global environments.

Approval History:

1. Scheme of study of BCA programme, its first year detailed syllabus and implementation rules approved by Board of Study of University School of Information, Communication and Technology on 15.12.2023.

2. Scheme of study of BCA programme, its first year detailed syllabus and implementation rules approved by Academic Council on 20.12.2023.

Bachelor of Computer Applications Curriculum Framework as per CCFUP

Aim: In accordance with the revised UGC Curriculum and Credit Framework for Undergraduate Programmes, the Bachelor of Computer Applications (BCA) programme w.e.f academic session 2024-25 curriculum framework shall be as follows:

The BCA programme covers basic to advanced level concepts in Computer Science, Computer Applications and Information Technology. The theoretical concepts in class room teaching and hands on machine experience in digital laboratories using computer program using computers and standard tools widen the horizon of the students. With the acquired knowledge, students can solve the problems in various domains using computers.

Eligibility Criteria: The students are required to refer the eligibility criteria provided in the admission brochure for BCA programme for the specific academic session. As per the Admission Brochure for the Academic Session (AS) 2023-24, the eligibility criteria for BCA programme is as follows:
"Pass in 12th Class of 10+2 of CBSE or equivalent with a minimum of 50% marks in aggregate* with pass in English (core or elective or functional). Mathematics or Computer Science / or other subject related to Computer Science".

OR

"Three-year Diploma in a branch of Engineering from a polytechnic duly approved by All India Council for Technical Education and affiliated to a recognized examining body with a minimum of 50% marks in aggregate".

Duration of the BCA Programme, Provision of Multiple Exit and Awarding Certificate, Diploma, and Degrees

The maximum duration of programme will be as per regulations and recommendations of the statutory bodies governing the BCA programme. As per existing UGC CCFUP, the total duration for completing the BCA programme from the date of admission in first year to completion of Certificate / Diploma / 3 years' degree/ 4 years Hons. degree (including Breaks) shall not exceed 7 years. The detailed qualification award (Certificate / Diploma/ Degree), exit options and other requirement is given in Table1. Grading System shall be as per Ordinance 11 of the University.

Table1: Duration and qualification Award Details:

No of years of completion	Qualification Awarded	Exit Options	Credit Requirement	Entry Option	Remarks
One Year (I & II Semester)	BCA Certificate	Students have an option of exiting the programme after completion of first year (Semester I and semester II)	Students are required to complete Minimum 52 credits including vocational course which is mandatory.	Students who exit with a BCA certificate are permitted to re-enter within three years from the date	Students are required to secure minimum 48 credits during first year and 4 credits in work based vocational courses during summer break after first year. ii. Students may be permitted to take a break from the study during the period of BCA programme but the total duration for completing the BCA

				when student took break and may complete the BCA programme.	programme from the date of admission in first year shall not exceed 7 years.
Two Years (I to IV Semesters)	BCA Diploma	Students have an option of exiting the programme after completion of second year (Semester III & IV)	Students are required to complete Minimum 96 credits and also secure 4 credits in skill based vocational course either offered after first year or after second year during the summer break time.	Students who exit with a BCA diploma are permitted to re-enter within three years from the date when student took break and may complete BCA programme.	i. Students exiting the programme after securing 96 credits in initial two years of admission will be awarded BCA Diploma provided they secure additional 4 credit in skill based vocational courses offered after first year or after second year during the summer break time. ii. Students may be permitted to take a break from the study during the period of BCA programme but the total duration for completing the BCA programme from the date of admission to first year shall not exceed 7 years.
Three Years (I to VI Semesters)	BCA	Students will be allowed to exit after completion of the 3rd year (V & VI semesters)	Students are required to complete Minimum 146 credits and also secure 4 credits in Summer Internship during the summer break time after 2nd year.	Students who exit with a BCA are permitted to re-enter within two years and complete the four year BCA, but the student is not entitled to re-enter for BCA (Honours).	Students who want to undertake 3-year BCA programme will be awarded BCA Degree upon securing 146 credits Students may be permitted to take a break from the study during the period of BCA programme but the total duration for completing the BCA programme from the date of admission year shall not exceed 7 years.
Four Years (I to VIII Semesters)	BCA Honours (Hons.)		Hons. shall only be awarded if the student acquires full credits in every semester with a total CGPA of above or equal to 7.5, and the degree is	--	Students will be awarded BCA (Hons.) Degree

			awarded after the immediate completion of the 4th year from the year of admission. No Hons. shall be conferred if the degree requirements are not completed in the minimum dura tion.		

It is envisioned that the graduates passing out BCA programme, will achieve the following BCA programme specific Learning Outcomes (PLO) and Generic Learning Outcomes (PO) as detailed in Table 2.

Table 2: Programme specific Learning Outcomes (PLO) and Generic Learning Outcomes (GLO)

Programme Specific Learning Outcomes (PLOs)	**Description**
PSO 1	Comprehensive knowledge and coherent understanding of the Computer Applications in various domains and emerging developments associated with the Computer Science and Information Technology
PSO 2	Practical, professional, and procedural knowledge required for carrying out professional or highly skilled work/tasks in the field of computer science and Information Technology, including knowledge required for undertaking self-employment initiatives, and knowledge and mindset required for entrepreneurship involving enterprise creation, improved product development, or a new mode of organization.
PSO 3	Skills in areas related to specialization in the chosen disciplinary/interdisciplinary area(s) of learning including wide-ranging practical skills, involving variable routine and non-routine contexts relating to the Computer Applications
PSO 4	Capacity to extrapolate from what has been learned, translate concepts to real-life situations and apply acquired competencies in new/unfamiliar contexts, rather than merely replicate curriculum content knowledge, to generate solutions to specific problems.
Programme Outcomes (PO)	The student should be able to demonstrate the capability to:
PO1	***Disciplinary Knowledge:*** Apply the knowledge of computer application concepts and domain knowledge to solve the problems in IT domain/IT industry
PO2	***Problem Analysis:*** Identify, formulate, review research literature, and analyse complex computer application problem at their workplace and for the society.
PO3	***Design /Development of Solutions:***

	Design and evaluate solutions for computer applications problems, and design the processes that meet specified needs with appropriate consideration for the public health, safety, cultural, societal, and environmental considerations.
PO4	***Modern Tool Usage:*** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computer application activities, with an understanding of the limitations.
PO 5	***Professional Ethics:*** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.
PO 6	***Life-long Learning:*** Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.
PO 7	***Project management and finance:*** Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 8	***Communication Efficacy with Cooperation/teamwork*** Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions. Function effectively as an individual and as a member or a leader.
PO 9	***Societal and Environmental Concern:*** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.
PO 10	***Innovation and Entrepreneurship*** Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

Curricular components of the BCA programme

The BCA programme curriculum consists of core courses and interdisciplinary / multidisciplinary courses from other disciplines, ability enhancement courses (language courses), skill enhancement courses, and a set of value added courses. Vocational courses are also added which will help the students to equip with job- oriented skills. The minimum credit requirements for each component for 3-year BCA and 4-year BCA (Hons.) are given in Table 3. The distribution of credits across semesters for BCA programme is given in Table 4.

Table 3: Category Wise Minimum Credit Requirements

S.No.	Broad Category of Course	Minimum Credit Requirement	
		3-year BCA	4-Year BCA (Hons.)
1	Core Courses (CCT/ CCP/PCE)	114	124
2	Multidisciplinary Courses	09	09
3	Ability Enhancement Courses (AEC)	08	08
4	Skill Enhancement Courses (SEC)	08	10
5	Value Added Courses (VA)	08	08
6	Summer Internship (SI)	04	04

7	Major/ Minor Project (PRJ)	06	22
	Total	**157**	**185**

The student is required to complete one Minor Project in the sixth semester, Major Project-1 in seventh semester and Major Project-2 in eight semesters, all from any emerging technologies.

Table 4: Distribution of Credits across Semesters for BCA Programme

S.No.	Broad Category of Course	Semester (Credits)							
		I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
1	CCT/ CCP/PCE	20	21	20	16	17	20	10	-
2	Multidisciplinary Courses	-	-	3	3	3	-	-	-
3	Ability Enhancement Courses (AEC)	3	3	-	2	-	-	-	-
4	Skill Enhancement Courses (SEC)	1	-	4	2	-	1	2	-
5	Value Added Courses (VA)	2	2	2	-	-	2	-	-
6	Summer Internship (SI)	-	-	-	-	4	-	-	-
7	Major/ Minor Project (PRJ)	-	-	-	-	-	6	6	10
	Total	**26**	**26**	**29**	**23**	**24**	**29**	**18**	**10**

***Multidisciplinary Generic Elective (GE) for BCA Students**

GE-1 (choose any One)

(i) Principles of Management & Organizational Behaviour

(ii) Any One Paper Offered as open elective by other School /Department / Programme

GE-2 (choose any One)

(i) Digital Marketing

(ii) Principles of Accounting

(iii)Any One Paper Offered as open elective by other School / Department / Programme

GE-3

(i) Introduction to Management & Entrepreneurship Development

(ii) MOOC Course

Vocational Courses Recommendations:

The objective of encouraging the students to undertake a vocational course during summer break after First Year (Second semester) and, also after third year (Sixth semester) for four years programme are

- To ensure the development of capabilities across a range of disciplines including sciences, social

sciences, arts, humanities, languages, as well as vocational subjects, a student can undertake programmes /courses of study relating to Languages, Literature, Music, Philosophy, Art, Dance, Theatre, Statistics, Pure and Applied Sciences, Sports, etc., and other such subjects needed for a multidisciplinary and stimulating learning environment

- To prepare professionals in cutting-edge areas that are fast gaining prominence, such as Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning, Block chain Technology, Full stack web development, Robotic Process Automation or any other emerging technology with important applications to health, environment, and sustainable living the students are also encouraged to undergo training in the emerging technologies which are not part of their curriculum.
- To find a job for those students who exit before completing the programme.

Summer Internship Recommendations

Students can undertake internships with local industry, businesses etc., or with faculty and researchers at their own or other Higher Educational Institutes (HEIs).
Summer Training (Conducted at the end of the 4th Semester and evaluation to be carried in 5th Semester) Report and Viva – Voce: Students will undergo summer training/industry visit/In-house training/In-house project during the summer break after the completion of 4th semester. This will help the students to engage with all aspects of their learning and facilitate their improvement in the employability. A report of the Summer Internship is required to be submitted to the College/ Institution. Viva-voce examination will be conducted based on the report submitted by the student. A panel of examiner will be appointed by the HOD/ Director of the Institution for internal evaluation out of 40 marks. External evaluation of 60 marks will be conduct by the examination division of the university.

Generic (Open) Electives for other undergraduate programmes

The following Core courses (as mentioned in Table 5) of BCA programme may be offered as Generic Elective for other undergraduate programmes. Maximum number of students from other School / Department / Programme should not exceed 20% of total intake for the programme.

Table 5: Generic (Open) Electives offered by BCA programmes for other undergraduate programmes

S.No.	Semester	Subject Code	Subject Name
1	I	BCA 105T BCA 105P	Web Technologies Web Technologies Lab
2	II	BCA 102T BCA 102P	Database Management System Database Management System Lab
3	III	BCA 201T BCA 201P	Python Programming Python Programming Lab

Major/ Minor Project Recommendations

The student shall undertake Minor Project in 6th Semester, Major Project -1 in 7th Semester and Major Project-2 in 8th Semester, all in any of the emerging areas. Four year students not undertaking Major Project-2 will do an industry internship throughout the eighth semester in lieu of a Major project-2 and will be awarded BCA (Hons.). The students who secure 185 credits, including 22 credits from Minor Project, Major Project-1 and Major Project-2 / internship, shall be awarded BCA (Hons.).

The semester wise evaluation scheme of BCA Programme are mentioned from Table 6 to Table 13.

Table 6: FIRST SEMESTER

Code No.	Paper	Course Category	L	T/P	Credits	Marks Internal	Marks External	Max Marks
Core Course Theory (CCT)								
BCA 101T	Programming for Problem Solving using C	**CCT**	4	-	4	40	60	100
BCA 103T	Fundamental of Information Technology	**CCT**	4	-	4	40	60	100
BCA 105**T#**	Web Technologies#	**CCT**	4	-	4	40	60	100
BCA 107T	Mathematical Foundation for Computer Science	**CCT**	4	-	4	40	60	100
Core Course Practical (CCP)								
BCA 101P	Programming for Problem Solving using C Lab	**CCP**	-	4	2	40	60	100
BCA 103P	Fundamental of Information Technology Lab	**CCP**	-	4	2	40	60	100
Ability Enhancement Course (AEC)								
BCA 141T	Writing Skills	AEC	3	-	3	100	-	100
Skill Enhancement Course (SEC)								
BCA 105**P#**	Web Technologies Lab	**SEC**	-	2	1	40	60	100
Value Added Course (VA)								
BCA 191T*	Understanding India*(NUES)	VA	2	-	2	100	-	100
Bridge Course (Mandatory for Students from Non Mathematics background)								
BCA 181T^{+}	Bridge Course in Mathematics+(NUES)	Mandatory for Students from Non Mathematics background	2	-	-	Pass Grade	-	-
	Total				**26**			**900**

*NUES (Non – University Examination Subject) – Only Internal Assessment by the Institute)

$^{+}$ NUES Non Credit subject mandatory for the students who do not have mathematics in 12th std.

Course Code: BCA 191T **L T C**
CourseName: Understanding India **2 0 2**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. There should be 10 questions of short answer type of 2 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks, including its subparts, if any.
3. Examiners are requested to go through the Course Outcomes (CO) of this course and prepare the question paper accordingly, in such a way that every question be mapped to some or other CO and all the questions, put together, must be able to achieve the mapping to all the CO(s), in balanced way.

LEARNING OBJECTIVES:

i. To have an understanding on history and culture of ancient India.
ii. The students will be acquainted with the literature, philosophy, art and architectural developments in India during the period concerned.
iii. To understand ancient India Knowledge system
iv. The students will also get to know about their constitutional rights and duties.

PRE-REQUISITES: Nil

COURSE OUTCOMES(COs):
After completion of this course, the learners will be

CO#	Detailed Statement of the CO
CO1	Familiar with the History and culture of Ancient India
CO2	Understanding the ancient Indian literature
CO3	Having awareness of the ancient knowledge system of India
CO4	Aware of Basic features of our constitution

Course Outcomes	Program Outcomes (Scale – 1:very low,2: low,3:medium,4:high)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	-	-	-	-	-	-	3	3	-
CO2	-	-	-	-	-	-	-	3	3	-
CO3	-	-	-	-	-	-	-	3	3	-
CO4	-	-	1	-	-	3	-	3	3	-

UNIT I

Introducing India : The People of India: demography and languages, The Name of our Country: Jambudvipa, Sindhu (Indus), Inde, Hind, Hindustan, BharatIndia
The idea of Bharatvarsha; Ancient Indian literatureSanskrit, Pali, Prakrit, Tamil Religions and philosophies of ancient India-Vedic, Buddhism, Jainism

UNIT II

Science, Technology and Medicine: A general survey of the progress of science,technology and medicine in ancient India
The Knowledge System of India:Traditional Knowledge System: Gurukuls, Pathsalas, Tols, Maktabs, Madrasas
Beginnings of Modern Education: Main features of British Government's educational policies
Growth of higher and technical education in India

UNIT III

The Indian Economy :Features of the Indian economy from past to present (agriculture, industry and trade)

UNIT IV

The Making of Contemporary India The struggle for Independence (1885-1947)
Basic features of Indian constitution: Basic Structure, Doctrine, Fundamental rights, and duties, Directive principles,Federal Structure, Independence of Judiciary and theParliamentary system

TEXT BOOKS:

TB1. A.L. Basham,The Wonder that Was India, Picador India,1971
TB2. R.S.Sharma,India'sAncientPast, NewDelhi, OUP, 2007
TB3. Upinder Singh, The History of the Ancient and Early Medieval India, Pearson, 2008
TB4. Satish Chandra, History of Medieval India, Arihant Publication, 2020.

REFERENCES:

RB1. Durga Das Basu, Introduction to the Constitution of India, Lexis Nexis, 2018 2003
RB2. Tirthankar Ray, The Economic History of India 1857-1947, OUP, 2006
RB3. Vijay Joshi and I.M.D. Little, India's Economic Reforms, 1991-2001, OUP, 1996
RB4. Dr. Prabhakiran Jain & R. Sharma, Understanding India, Mahavir Publication