

SCHEME OF EXAMINATION

&

SYLLABI

for

Bachelor of Computer Applications (BCA)
Scheme and Syllabus (w.e.f. AS 2021-22)

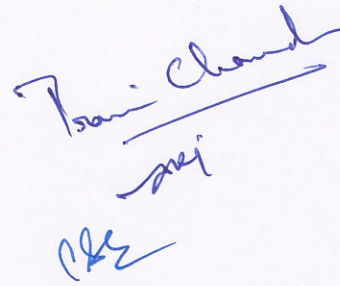
Offered by

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



GURU GOBIND SINGH
INDRAPRASTHA
UNIVERSITY

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www.ipu.ac.in



Approved by BoS of USICT: 31/10/2021,
Applicable from Batch Admitted in Academic Session 2021-22 Onwards

Approved by AC sub-committee: 22/11/2021

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Pravin Chaudhary
and
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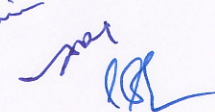
Vision of the School

Create high-quality engineering 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.



Pravin Choudhary
22/11/2021


I. BACHELOR OF COMPUTER APPLICATIONS PROGRAMME DETAILS

1. Aim

The programme covers rudimentary to advanced concepts in Computer Science and its applications in various domains. An exceptionally broad range of topics covering current trends and technologies in the field of information technology and computer science are included in the syllabus. The hands on sessions in Computer labs using various Programming languages and tools are also given to have a deep conceptual understanding of the topics to widen the horizon of students' self- experience. Students, who choose BCA Programme, develop the ability to think critically, logically, analytically and to use and apply current technical concepts and practices in the core development of solutions in the multiple domains. The knowledge and skills gained with a degree in Computer Application prepare graduates for a wide range of jobs in education, research, government sector, business sector and industry. In broader perspective the mission of teaching BCA is to produce employable IT workforce, that will have sound knowledge of IT and business fundamentals that can be applied to develop and customize solutions for various Enterprises.

2. Programme Objectives

It is envisioned that the graduates passing out BCA degree, will achieve the following objectives and will be able to

Programme Objectives (POs)	Description
PO1	Understand the fundamental concepts of Computers, Software hardware and peripheral devices and evolution of computer technologies.
PO2	Familiarized with Business environment and Information Technology and its Applications in different domains.
PO3	Gain knowledge to identify, explain and apply functional programming and object-oriented programming techniques and use of databases to develop computer programs.
PO4	Analyze, design, implement and evaluate computerized solutions to real life problems, using appropriate computing methods including web applications.
PO5	Understand the front end and backend of software applications.
PO6	Gain expertise in at least one emerging technology.
PO7	Acquire knowledge about computer networks, network devices and their configuration protocols, security concepts at various level etc.
PO8	Apply techniques of software validation and reliability analysis to the development of computer programs.
PO9	Acquire Technical, Communication and management Skills to convey or present information, applications, instructions, policies, procedures, decisions, documentations etc. verbally as well as in writing.
PO10	Recognize the various issues related to society, environment, health and vivid cultures and understand the responsibilities to contribute in providing the solutions.
PO11	Acquire technical skills to lead a productive life in the society as a professional or as an entrepreneur.

3. Programme Learning Outcomes

The completion of the BCA Programme shall enable a student to:

- i. To design, implement, and evaluate computer-based system, process, component, or program to meet desired needs by critical understanding, analysis and synthesis
- ii. Identify applications of Computer Science in other fields in the real world to enhance the career prospects
- iii. Realize the requirement of lifelong learning through continued education and research.
- iv. Use the concepts of best practices and standards to develop user interactive and abstract application
- v. Understand the professional, ethical, legal, security, social issues and responsibilities.

The detailed list of programme learning outcomes is as follows:

PLO	Attribute	Description
PLO1	Communication Skills	The student should be able to communicate the technical information both orally and in writing professionally.
PLO2	Use of Software Tools	Create, select, adapt and apply suitable tools and technologies to a wide range of computational activities.
PLO3	Technical Skills	Acquire necessary knowledge of technical, scientific as well as basic managerial and financial procedures to analyze and solve real world problems within their work domain
PLO4	Domain Awareness	Clarity on both conceptual and application oriented skills in commerce, Finance & Accounting and its Applications in Business context.
PLO5	Technical Support	Must be able to provide technical support for various software applications.
PLO6	Analysis and investigation of Complex Computing Problems	Ability to analyze research and investigate complex computing problems through design of experiments, analysis and interpretation of data and synthesis of the information to arrive at valid conclusions.
PLO7	Design / Development of Solutions	Apply the knowledge gained in core courses to a broad range of advanced topics in computer science, to learn and develop sophisticated technical products independently.
PLO8	Imbibe Cyber Ethics	Awareness on ethics, values, sustainability and creativity aspects of technical solutions.

II. CHOICE BASED CREDIT SYSTEM (CBCS)

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses.

1. Types of courses in Choice Based Credit System (CBCS)

1.1 Core Course: A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

1.2 Elective Course: Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

a) **Discipline Specific Elective (DSE) Course:** Elective courses offered by the main discipline/subject of study are referred to as Discipline Specific Electives.

b) **Project work/Dissertation** is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A candidate studies such a course on his own with an advisory support by a teacher/faculty member. The work done will have to be submitted in writing as a dissertation.

c) **Generic Elective (GE) Course:** Elective courses that are generic or interdisciplinary by nature chosen from an unrelated discipline/ subject with an intention to seek exposure beyond discipline/s of choice are called Generic Electives. Students will have to choose one elective each in the third and fourth semester from the lists GE1 to GE2 given in this syllabus.

1.3 Ability Enhancement Courses (AEC): The Ability Enhancement (AE) Courses are the course that lead to Knowledge enhancement. These are of two types.

a) **AE Compulsory Course (AECC):** Environmental Studies, English Communication/MIL Communication.

b) **AE Elective Course (AEEC):** AEEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc. These courses / papers are to be chosen from a pool of courses designed to provide value-based and/or skill-based instruction.

III. PROGRAMME STRUCTURE

The BCA programme is a three-year course of 160 credits divided into six-semesters. A student is required to complete 150 credits for the completion of course and the award of degree.

	Academic Year	Odd Semester	Credits	Even Semester	Credits
Part – I	First Year	Semester I	26	Semester II	26
Part – II	Second Year	Semester III	27	Semester IV	27
Part – III	Third Year	Semester V	27	Semester VI	29
Total Credits – 162			80		82

Eligibility Criteria: The eligibility criteria for BCA programme for an academic session will be provided in the admission brochure (as for Academic Session (AS) 2021-22. The eligibility criteria of BCA programme for academic session 2022-23 onwards shall be 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 / Informatics Practice / Computer Applications / Multimedia & Web Technology / Data Management Application / Web Application as compulsory subject of non-vocational stream with 50 theory and 50 practical ratio) or equivalent.”

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.”

Admission Criteria: Admission shall be based on the merit of the written test /Common Entrance Test Conducted by the University.

IV. INSTRUCTIONS FOR PAPER SETTERS

- Question Paper setter for each course must refer the instructions provided with the detailed syllabus of the specific courses.
- The question paper shall be preferably set from the prescribed text books and reference books, mentioned in the syllabus and should be at the level of the prescribed textbook(s).

V. CREDIT ALLOCATION (BCA PROGRAMME OF STUDY)

Course	Credits	
	Theory + Practical	Theory + Tutorial
	Core Course (6 credits) (12 papers)	Core Course (4 credits) (7 papers)
Core Course Theory 19 Papers	12x4=48	7x3=21
Core Course Practical / Tutorial* 19 Papers	12x2=24	7x1=7
Elective Course (4 Papers of 5 credits each, 5 Papers of 4 credits each and 7 Papers of 2 credits each)		
A.1. Discipline Specific Elective (4 Papers)	4x4 = 16	
A.2. Discipline Specific Elective Practical/Tutorial* (4 Papers)	1x4 = 04	
B.1. Generic Elective/ Interdisciplinary (2 Papers)		2x3 = 06
B.2. Generic Elective Practical/ Tutorial* (2 Papers)		2x1 = 02
1.Ability Enhancement Compulsory Courses(AECC) (3 Papers of 4 credit each and 1 Paper of 6 Credit including Minor & Major Project)	1x4 + 1x6= 10	2x4=8
2. Ability Enhancement Compulsory Courses(AECC) (2 Papers of 2 credit)		2x2 = 04
Skill Enhancement Courses (SEC) (5 Papers of 2 credit each)	5x2 = 10	
Co-Curricular Activities	2	
Total credit 162	114	48

*Wherever there is practical, there will be no tutorial and vice-versa.

V. CBCS COURSE STRUCTURE FOR BCA PROGRAMME

1. Semester wise placement of the courses

Semester	CORE COURSE (18)	Ability Enhancement Compulsory Course (AECC) (3)	Skill Enhancement Course (SEC) (2)	Elective: Discipline Specific (DSE) (5)	Elective: Generic (GE) (2)
I Total Credits 26	CC1 (4) Discrete Mathematics	AECC 1 (4) Technical Communication			
	CC2 (4+2) Programming using 'C' Language				
	CC3(4+2) Fundamentals of IT & Computers				
	CC4 (4+2) Web Technologies				
II Total Credits 26	CC5 (4) Applied Mathematics	AECC2 (2) Environment Studies	SEC -1 (2)		
	CC6 (4+2) Web Based Programming				
	CC7 (4+2) Data Structure And Algorithm Using 'C'				
	CC8 108 (4+2) Database Management System				
III Total Credits 27	CC9 (4) Computer Network	AECC3 (2) Human Values and ethics	SEC -2 (2)	DSE- 1 (4+1)	Any course from the list GE-1(4)
	CC10 (4) Computer Organization and Architecture				
	CC11 (4+2) Object Oriented Programming with C++				
IV Total Credits 27	CC12(4+2) Java Programming	AECC4 (4) Introduction to Management & Entrepreneurship Development	SEC-3 (2) Personality Development Skills	DSE -2 (4+1)	Any course from the list GE-2 (4)
	CC13 (4+2) Software Engineering				
V Total Credits 27	CC14 (4+2) Operating System & Linux Programming	AECC 5 Minor Project (4)	SEC-4 (2) Summer Internship	DSE -3 (4+1)	
	CC15(4+2) Computer Graphics				
	CC 16 (4) Cloud computing				
VI Total Credits 27	CC17 (4) Datawarehousing and Data Mining	AECC 6 Major Project (6)	SEC-5 (2) Seminar/ Conference Presentation	DSE -4 (4+1)	
	CC18 (4) E-Commerce				
	CC19 (4+2) Internet of Things				

1.1 Skill Enhancement Course 1 (SEC - 1)

SEC 1 (choose one) Skill development course from the following

- MOOC course from SWAYAM / NPTEL of minimum 2 credits. Certificate is Mandatory for the degree
- Front End Design Tool VB.Net Lab
- Statistical Analysis using Excel
- Designing Lab Photoshop

SEC 2 (choose one)

- (i) MOOC course From Swayam / NPTEL of minimum 2 credits. Certificate is Mandatory for the degree)
- (ii) Designing Lab CorelDraw
- (iii) ASP.Net
- (iv) AR/VR

1.2 Discipline Specific Electives (DSE) (Choose any One Group of DSE)

Every institution shall offer at least to DSE groups to the students subject to conditions enumerated in this document.

DSE-A – Data Science & Analytics

- 1. Basics of Python Programming
- 2. Introduction to Data Science
- 3. Data Visualization & Analytics
- 4. Machine Learning with Python

DSE-B – Artificial Intelligence & Machine Learning

- 1. Basics of Python Programming
- 2. Introduction to Artificial Intelligence
- 3. Machine Learning with Python
- 4. Deep Learning with Python

DSE-C– Cyber Security

- 1. Cyber Security
- 2. Network Security
- 3. Web Security
- 4. IT Acts and Cyber Laws

DSE-D – Software Development

- 1. Basics of Python Programming
- 2. Web Development with Python
- 3. Web Development with Java & JSP
- 4. Mobile Application Development

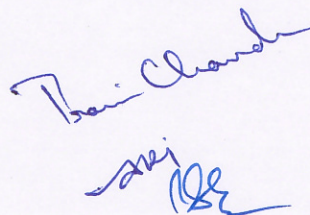
1.3 Generic Elective (GE) for BCA Students

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)

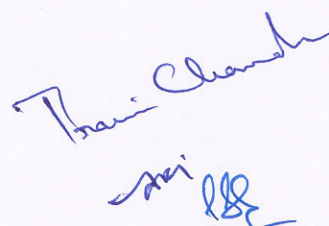
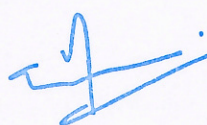
- (i) Digital Marketing
- (ii) Principles of Accounting
- (iii) Any One Paper Offered as open elective by other School / Department / Programme



1.4 Generic (Open) Electives for other undergraduate programmes

The following Core courses 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.

S.No.	Semester	Subject Code	Subject Name
1	I	BCA 105 BCA 173	Fundamentals of Computers & IT Practical – II IT Lab
2	I	BCA 107 BCA 175	Web Technologies Practical-III Web Tech Lab
3	II	BCA 108 BCA 176	Database Management System Practical – VI DBMS Lab
4	III	BCA 205 BCA 271	Object Oriented Programming using C++ Practical – VI C++ Lab
5	III	BCA 211	Basics of Python Programming
6	VI	BCA 304	E-Commerce



SEMESTER WISE EXAMINATION SCHEME

Based on the above-mentioned course categories the semester wise Evaluation scheme of BCA Programme will be as follows:

FIRST SEMESTER EXAMINATION

Code No.	Paper	Course Category	L	T/P	Credits	Marks Internal	Marks External	Max Marks
Core Course Theory								
BCA 101	Discrete Mathematics	Core Course Theory	3	1	4	25	75	100
BCA 103	Programming Using 'C' Language	Core Course Theory	3	1	4	25	75	100
BCA 105#	Fundamentals of Computers & IT	Core Course Theory	3	1	4	25	75	100
BCA 107#	Web Technologies	Core Course Theory	3	1	4	25	75	100
Ability Enhancement Compulsory Course (AECC)								
BCA 109	Technical Communication	AECC	3	1	4	25	75	100
Core Course Practicals								
BCA 171	Practical – I 'C' Prog. Lab	Core Course Practical	0	4	2	40	60	100
BCA 173#	Practical – II IT Lab	Core Course Practical	0	4	2	40	60	100
BCA 175#	Practical-III Web Tech Lab	Core Course Practical	0	4	2	40	60	100
Bridge Course (Mandatory for Students from Non Mathematics background)								
BCA 181*	Bridge Course in Mathematics	Mandatory for Students from Non Mathematics background	2	0	0	Pass Grade	-----	-----
Total Credits					26			800

* Non Credit subject mandatory for the students who do not have mathematics in 12th Std. The student has to obtain at least 40 marks. The examination of this paper shall be conducted by the concerned teacher teaching the course / paper as Teacher's Continuous Evaluation for total 100 marks. Only the pass or fail status is to be specified on the marksheet of examination and the result of the student. Passing in this paper is mandatory for the student.

Generic Elective (GE) for other undergraduate programmes

TOTAL MARKS: 800

SECOND SEMESTER EXAMINATION

Code No.	Paper	Course Category	L	T/P	Credits	Marks Internal	Marks External	Max Marks
Core Course Theory								
BCA 102	Applied Mathematics	Core Course Theory	3	1	4	25	75	100
BCA 104	Web based Programming	Core Course Theory	3	1	4	25	75	100
BCA 106	Data Structure And Algorithm Using 'C'	Core Course Theory	3	1	4	25	75	100
BCA 108#	Database Management System	Core Course Theory	3	1	4	25	75	100
Ability Enhancement Compulsory Course (AECC)								
BCA 110	Environment Studies	AECC	2	0	2	25	75	100
*Skill Enhancement Course (AEEC) (Choose any One)								
BCA 132	**MOOC course from SWAYAM / NPTEL	SEC-1	0	0	2	100	0	100
BCA 134	Front End Design Tool VB.Net Lab	SEC-1	0	4	2	100	0	100
BCA 136	Statistical Analysis using Excel	SEC-1	0	4	2	100	0	100
BCA 138	Designing Lab Photoshop	SEC-1	0	4	2	100	0	100
Core Course Practical								
BCA 172	Practical-IV WBP Lab	Core Course Practical	0	4	2	40	60	100
BCA 174	Practical – V DS Lab	Core Course Practical	0	4	2	40	60	100
BCA 176#	Practical – VI DBMS Lab	Core Course Practical	0	4	2	40	60	100
Total					26			900

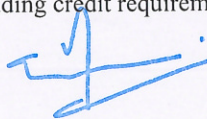
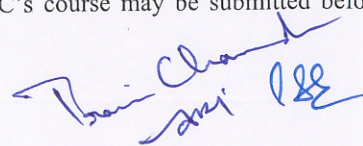
*NUES (Non – University Examination Subject) – Only Internal Assessment by the Institute)

Generic Elective (GE) for other undergraduate programmes

TOTAL MARKS: 900

****Instructions for MOOC course**

- MOOC Course should be done from SWAYAM/NPTEL as per the guidelines of UGC.
- For securing the credits, the student is required to complete the assessment of the course and to provide the certificate of the course done from SWAYAM/NPTEL.
- The fees (if any) for the registration and/or assessment of the MOOC course must be borne by the student only.
- If the student secures more than 2 credits for the MOOC Course even then 2 credits shall be considered for this subject and the grade/marks provided by assessing authority shall be transferred to the university by the institution where the student is studying. The result of the MOOC courses shall be taken on record by the University's Examination Division and a result declared for these papers. The student must submit the result of such papers to their respective institutions. All results for the MOOC's course may be submitted before the completion of other requirements including credit requirements.

THIRD SEMESTER EXAMINATION

Code No.	Paper	Course Type	L	T/P	Credits	Marks Internal	Marks External		Max Marks
							Th	Pr	
Core Course Theory									
BCA 201	Computer Network	Core Course Theory	3	1	4	25	75	0	100
BCA 203	Computer Organization and Architecture	Core Course Theory	3	1	4	25	75	0	100
BCA 205#	Object Oriented Programming with C++	Core Course Theory	3	1	4	25	75	0	100
Ability Enhancement Compulsory Course (AECC)									
BCA-207	Human Values and Ethics	AECC	2	0	2	25	75	0	100
*Discipline Specific Elective (Choose any One)									
BCA 211#	Basics of Python Programming	DSE-1	4	1	5	25	50	25	100
BCA 213	Cyber Security	DSE-1	4	1	5	25	50	25	100
**Generic Elective (Choose any One)									
BCA 221	Principles of Management & Organizational Behaviour	GE-1	3	1	4	25	75	0	100
BCA 223	Open Elective offered by other Department/School /programme	GE-1	3	1	4	25	75	0	100
***Skill Enhancement Course (AEEC) (Choose any One)									
BCA 231	****MOOC course from SWAYAM / NPTEL	SEC-2	0	0	2	100	0	0	100
BCA 233	Designing Lab CorelDraw	SEC-2	0	0	2	100	0	0	100
BCA 235	ASP.Net	SEC-2	0	0	2	100	0	0	100
BCA 237	AR/VR	SEC-2	0	0	2	100	0	0	100
Core Course Practical									
BCA 271#	Practical – VII C++ Lab #	Core Course Practical	0	4	2	40	0	60	100
Total						27			800

Generic Elective (GE) for other undergraduate programmes

* First Subject from Discipline specific chosen group

** Choose one subject from list of GE-1

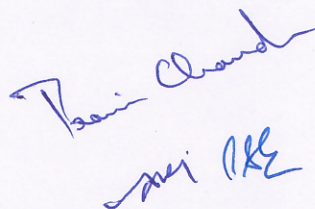

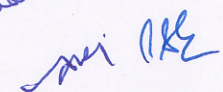
*** NUES (Non – University Examination Subject) – Only Internal Assessment by the Institute, that is the assessment shall be conducted by the institution for all 100 marks as Teacher's Continuous Assessment.

**Instructions for MOOC course

1. MOOC Course should be done from SWAYAM/NPTEL as per the guidelines of UGC.
2. For securing the credits, the student is required to complete the assessment of the course and to provide the certificate of the course done from SWAYAM/NPTEL.

3. The fees (if any) for the registration and/or assessment of the MOOC course must be borne by the student only.
4. If the student secures more than 2 credits for the MOOC Course even then 2 credits shall be considered for this subject and the grade/marks provided by assessing authority shall be transferred to the university by the institution where the student is studying. The result of the MOOC courses shall be taken on record by the University's Examination Division and a result declared for these papers. The student must submit the result of such papers to their respective institutions. All results for the MOOC's course may be submitted before the completion of other requirements including credit requirements.
5. If the student secures more than 2 credits for the MOOC Course even then 2 credits shall be considered for this subject and the grade/marks provided by assessing authority shall be transferred to the university.

TOTAL MARKS: 800

FOURTH SEMESTER EXAMINATION

Code No.	Paper	Course Type	L	T/P	Credits	Marks Internal	Marks External		Max Marks
							Th	Pr	
Core Course Theory									
BCA 202	Java Programming	Core Course Theory	3	1	4	25	75	0	100
BCA 204	Software Engineering	Core Course Theory	3	1	4	25	75	0	100
Ability Enhancement Compulsory Course (AECC)									
BCA 206	Introduction to Management & Entrepreneurship Development	AECC	3	1	4	25	75	0	100
*Discipline Specific Elective (Choose any One)									
BCA 212	Introduction to Data Science	DSE-2	4	1	5	25	50	25	100
BCA 214	Introduction to Artificial Intelligence	DSE-2	4	1	5	25	50	25	100
BCA 216	Network Security	DSE-2	4	1	5	25	50	25	100
BCA 218	Web Development with Python	DSE-2	4	1	5	25	50	25	100
**Generic Elective (Choose any One)									
BCA 222	Digital Marketing	GE-2	3	1	4	25	75	0	100
BCA 224	Principles of Accounting	GE-2	3	1	4	25	75	0	100
BCA 226	Open Elective offered by other Department/ School /programme	GE-2	3	1	4	25	75	0	100
***Skill Enhancement Course (AECC)									
BCA 232	Personality Development Skills	SEC-3	2	0	2	100	0	0	100
Core Course Practical									
BCA 272	Practical –XII Java Lab	Core Course Practical	0	4	2	40	0	60	100
BCA 274	Practical – IX SE Lab	Core Course Practical	0	4	2	40	0	60	100
Total									800

* Second Subject from Discipline specific chosen group

** Choose one subject from list of GE-2

*** NUES (Non – University Examination Subject) – Only Internal Assessment by the Institute, that is the assessment shall be conducted by the institution for all 100 marks as Teacher's Continuous Assessment.

Summer Training will be held for 4 weeks after the end of fourth semester.

Viva-Voce will be conducted in fifth semester.

TOTAL MARKS: 800

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ani (PSE)

FIFTH SEMESTER EXAMINATION									
Code No.	Paper	Course Type	L	T/P	Credits	Marks Internal	Marks External		Max Marks
							Th	Pr	
Core Course Theory									
BCA 301	Operating System & Linux Programming	Core Course Theory	3	1	4	25	75	0	100
BCA 303	Computer Graphics	Core Course Theory	3	1	4	25	75	0	100
BCA 305	Cloud Computing	Core Course Theory	3	1	4	25	75	0	100
Ability Enhancement Compulsory Course (AECC)									
BCA 307	Minor Project	AECC	0	8	4	40	0	60	100
*Discipline Specific Elective (Choose any One)									
BCA 311	Data Visualization & Analytics	DSE-3	4	1	5	25	50	25	100
BCA 313	Machine Learning with Python	DSE-3	4	1	5	25	50	25	100
BCA 315	Web Security	DSE-3	4	1	5	25	50	25	100
BCA 317	Web Development with Java & JSP	DSE-3	4	1	5	25	50	25	100
Skill Enhancement Course (AECC)									
BCA 331	**Summer Training Project	SEC-4	0	0	2	100	0	0	100
Core Course Practical									
BCA 371	Practical – X Linux - OS Lab	Core Course Practical	0	4	2	40	0	60	100
BCA 373	Practical – XI CG Lab	Core Course Practical	0	4	2	40	0	60	100
	Total				27				800

* Third Subject from Discipline specific chosen group

** NUES (Non – University Examination Subject) – Only Internal Assessment by the Institute, that is the assessment shall be conducted by the institution for all 100 marks as Teacher's Continuous Assessment.

TOTAL MARKS: 800

SIXTH SEMESTER EXAMINATION

Code No.	Paper	Course Type	L	T/P	Credits	Marks Internal	Marks External		Max Marks
							Th	Pr	
Core Course Theory									
BCA 302	Data Ware Housing & Data Mining	Core Course Theory	3	1	4	25	75	0	100
BCA 304#	E- Commerce	Core Course Theory	3	1	4	25	75	0	100
BCA 306	Internet of Things	Core Course Theory	3	1	4	25	75	0	100
Ability Enhancement Compulsory Course (AECC)									
BCA 308	***Major Project	AECC	----	12	6	40	0	60	100
*Discipline Specific Elective (Choose any One)									
BCA 312	Machine Learning with Python	DSE-4	4	1	5	25	50	25	100
BCA 314	Deep Learning with Python	DSE-4	4	1	5	25	50	25	100
BCA 316	IT Act and Cyber Laws	DSE-4	4	1	5	25	75		100
BCA 318	Mobile Application Development	DSE-4	4	1	5	25	50	25	100
**Skill Enhancement Course (AEEC)									
BCA 332	Seminar/ Conference Presentation	SEC – 5	0	0	2	100	0	0	100
Core Course Practical									
BCA 372	Practical – XII IOT Lab	Core Course Practical	0	4	2	40	0	60	100
BCA374	NSS / NCC / Cultural clubs / Technical Society / Technical club\$	Mandatory	-	-	2	100	0	0	100
Total						29			800

*Fourth Subject from Discipline specific chosen group

** NUES (Non – University Examination Subject) – Only Internal Assessment by the Institute), that is the assessment shall be conducted by the institution for all 100 marks as Teacher’s Continuous Assessment. Evaluation will be based on the presentation on any latest technology/research article in in-house/external seminar/conference and will be conducted by the college committee only.

*** The student shall do the Major project in the Discipline Specific Area/Curriculum based subject /any emerging technology.

Generic Elective (GE) for other undergraduate programmes

\$NUES : Comprehensive evaluation of the students by the concerned coordinator of NCC / NSS / Cultural Clubs / Technical Society / Technical Clubs, out of 100 as per the evaluation schemes worked out by these activity societies, organizations at the institution / University level; the co-ordinators shall be responsible for the evaluation of the same. These activities shall start from the 1st semester and the evaluation shall be conducted at the end of the 6th semester for students admitted in the first semester.

Note: Any Elective Subject will be offered if minimum 1/3 rd of the total strength of students in the class will opt for it.