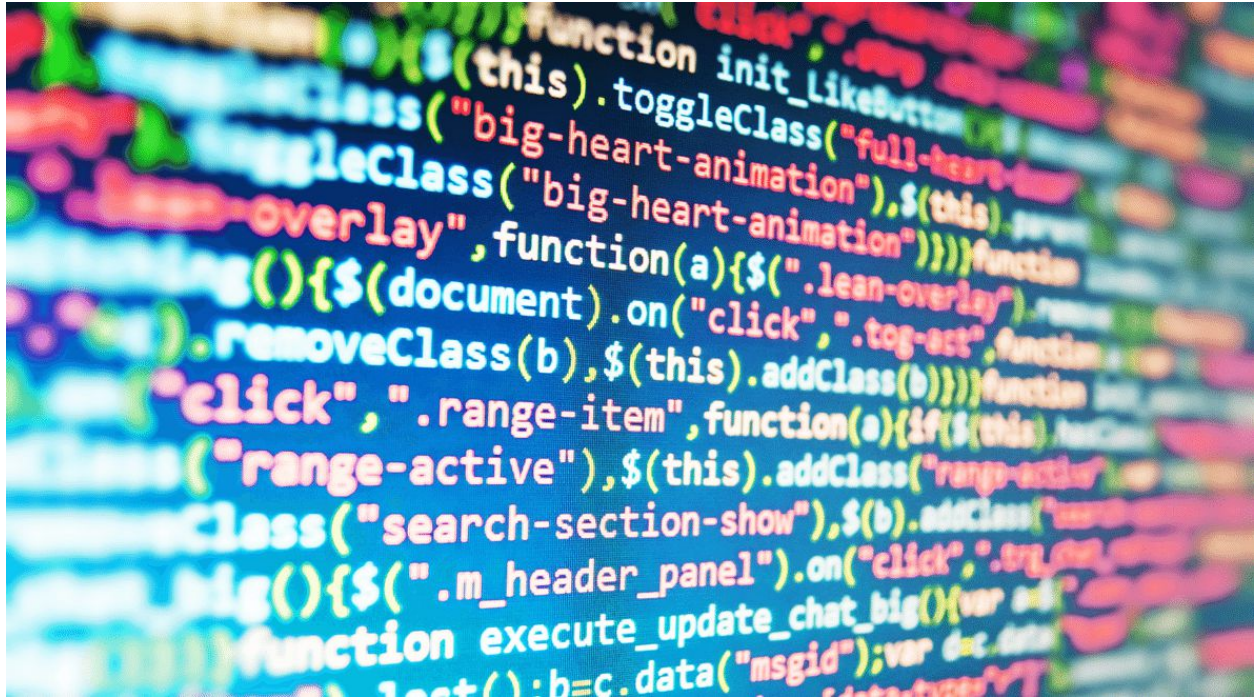




SYLLABUS OUTLINE FOR BACHELOR OF COMPUTER APPLICATION



**DEPT. OF COMPUTER SCIENCE &
ENGINEERING**

PREAMBLE

PROGRAMME EDUCATIONAL OBJECTIVES

This scheme and courses are related to three-year Bachelor of Computer Application program with following Program Educational Objectives (PEO).

1. Graduates of the program will have successful technical and professional careers in industry, academia, govt. and entrepreneurship.
2. Graduates of the program will hold strong professional ethics with good team skills and communication
3. Graduates of the program will engage in lifelong learning to acquire new knowledge in an evolving technological landscape.

TYPES OF COURSES

1. Courses are the subjects that comprise the Bachelor of Computer Application.
2. A course may be designed to comprise lectures, tutorials, laboratory work, fieldwork, outreach activities, project work, vocational training, viva, seminars, term papers, assignments, presentations, self-study etc. or a combination of some of these components.
3. The learning outcomes of each course will be defined before the start of a semester.
4. Following are the course types:
 - i. **Core Course (CC):** This is a course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of BCA.
 - ii. **Elective Course:** An elective course is a course, which can be chosen from a pool of courses. It is intended to support the discipline of study by providing an expanded scope, enabling exposure to another discipline/domain and nurturing a student's proficiency and skill. An elective may be of following types:
 - a) **Discipline Specific Elective (DE):** It is an elective course that adds proficiency to the students in the discipline.
 - b) **Generic Elective (GE):** It is an elective course taken from other engineering disciplines and enhances the generic proficiency and interdisciplinary perspective of students.
 - iii. **Obligatory Courses:**
 - a) **Dissertation/Project/Training/Internship (PTI):** Course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project
 - b) **Humanities, Social Sciences & Management (HSM):** It is an elective course taken from non-engineering disciplines (humanities, social sciences and management) that broadens the perspective of an engineering student.
 - c) **Basic Science Courses (BSC):** It is based upon content that leads to fundamental knowledge enhancement in sciences, and basic engineering principles.

- d) **NPTEL (NPT):** Online MOOC courses are based on the respective year's offered courses.
- e) **General Studies Courses (GSC):** Course designed to encourage and enrich the students for the technical and professional exams

Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credits
Or	Or
2 Hr. Practical (Lab)/week	1 Credit

- 5. A project work/dissertation is considered as a special course involving application of the knowledge gained during the course of study in exploring, analyzing and solving complex problems in real life applications. A candidate completes such a course with an advisory support by a faculty member.
- 6. A course may have pre-requisite course(s) that are given in the Semester-wise Course Allocation scheme.
- 7. A student can opt for a course only if he/she has successfully passed its pre- requisite(s).
- 8. A student has to register for all courses before the start of a semester.
- 9. **General Electives:** A student may take a course under the category of General Elective (GE) offered by any other Department of the Institute under the categories of Core Course (CC) and Discipline Specific Electives (DE). However, such options shall be offered to a student as per prescribed guidelines of the Institute.
- 10. The opting of a course by the student will depend upon the requisites for that course and with the consent of the course advisor.

PROGRAM OUTCOMES

- I. At the completion of the B.C.A. Bachelor of Computer Application Program, a student will achieve the following outcomes:
- II. Gain an ability to apply the knowledge of mathematics, science, Engineering fundamentals and computer engineering in solving complex engineering problems.
- III. Acquire the ability to survey the literature, conduct experiments, interpret data and analyze complex engineering problems.
- IV. Acquire the ability to design a system, its components and processes to meet requirements with due regard to social, economic and environmental considerations.
- V. Acquire the ability to apply research based knowledge and methods to investigate complex engineering problems with focus on computer engineering.
- VI. Acquire the ability to select existing tools, techniques and resources and create new ones to model complex engineering problems and activities.
- VII. Understand the responsibilities of an engineering profession towards society, economy, health, safety and legal issues.

- VIII. Understand a computer engineer's role in enhancing sustainable development.
- IX. Demonstrate professional ethics and responsibilities with utmost integrity at all times
- X. Acquire the ability to contribute effectively as members or leaders of diverse and multidisciplinary teams.
- XI. Communicate effectively among professional and with society through reports, presentations, documentations and instructions.
- XII. Engage in lifelong learning in ever evolving landscape of computer science and engineering.

SCHEME – SEMESTER WISE COURSE ALLOCATION

First Semester Syllabus							
Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	HSM	BCA101	General English& Soft Skill	3	0	2	4
2	CC	BCA103	Basic Computation & Principles of Computer Programming	3	1	3	5.5
3	DE*		Elective-I	3	0	3	4.5
4	DE**		Elective-II	3	0	3	4.5
5	GE*		Elective-III	3	0	0	3
6	GSC	GSC101	ESP & SDP-I	0	1	0	1
Total							22.5

Students will undergo a mandatory induction program

Suggestive Choice Based Subjects

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	DE*	BCA104A	Introduction to Windows Programming	3	0	3	4.5
2	DE*	BCA104B	Introduction to Python Programming	3	0	3	4.5
3	DE**	BCA105A	Analog Electronics	3	0	3	4.5
4	DE**	BCA105B	Digital Electronics	3	0	3	4.5
5	GE*	BCA106A	E-Commerce	3	0	0	3
6	GE*	BCA106B	Business System & Administration	3	0	0	3

Second Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	HSM	BCA201	Professional Writing& Technical Seminar	3	0	3	4.5
2	BSC	BCA202	Mathematics - I	3	0	0	3
3	CC	BCA203	Object Oriented Programming using C++	3	0	3	4.5
4	DE*		Elective-I	3	0	3	4.5
5	DE**		Elective-II	3	0	3	4.5
6	GE*		Generic Elective	3	0	0	3
7	PTI	INT201	Inter/Intra Institutional Activity	0	0	4	2
8	GSC	GSC201	ESP & SDP-II	0	1	0	2
Total							27

Students have to take one mandatory NPTEL course-based on the respective year's offered courses.

Suggestive Choice Based Subjects

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	DE*	BCA204A	Introduction to Linux	3	0	3	4.5
2	DE*	BCA204B	Computer Fundamentals & Emerging Technology	3	0	3	4.5
3	DE**	BCA205A	Simulation & Modeling	3	1	3	5.5
4	DE**	BCA205B	IT & Software Testing	3	1	3	5.5
5	GE*	BCA206A	Environment & Ecology	3	0	0	3
6	GE*	BCA206B	Management Accounting	3	0	0	3

Third Semester Syllabus

SI No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	CC	BCA301	Operating System	3	0	3	4.5
2	CC	BCA302	Mathematics-II	3	0	0	3
3	CC	BCA303	Data Structures using Python	3	1	3	5.5
4	DE*		Elective-I	3	1	3	5.5
5	DE**		Elective-II	3	0	0	3
6	GE*		Generic Elective	3	0	0	3
7	GSC	GSC301	ESP & SDP-III	0	1	0	2
			Total				25.5

Students have to take one mandatory NPTEL course-based on the respective year's offered courses.

Suggestive Choice Based Subjects

SI No	Type	Subject Code	Topic	L	T	P	Credit Points
1	DE*	BCA304A	Data Communication & Networking	3	1	3	5.5
2	DE*	BCA304B	Information Technology	3	1	3	5.5
3	DE**	BCA306A	Data Mining& Warehouse	3	0	0	3
4	DE**	BCA306B	System Analysis & Design	3	0	0	3
5	GE*	BCA305A	Cost Accounting	3	0	0	3
6	GE*	BCA305B	Business Accounting	3	0	0	3

Fourth Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	CC	BCA401	Database Management System	3	1	3	5.5
2	CC	BCA402	Object Oriented Programming using Java	3	1	3	5.5
3	CC	BCA403	Formal Languages & Automata Theory	3	0	0	3
4	CC	BCA404	Discrete Mathematics	3	0	0	3
5	DE*		Elective-I	3	0	2	4
6	DE**		Elective-II	3	0	2	4
7	PTI	INT401	Internship Industrial Training	0	0	6	3
8	GSC	GSC401	ESP & SDP-IV	0	1	0	1
Total							29

Students have to take one mandatory NPTEL course-based on the respective year's offered courses.

Suggestive Choice Based Subjects

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	DE*	BCA404A	Computer Graphics & Multimedia Technology	3	0	3	4.5
2	DE*	BCA404B	Foundation to Computer System Design	3	0	3	4.5
3	DE**	BCA405A	Web Development with ASP.NET	3	0	3	4.5
4	DE**	BCA405B	Statistical Modeling using R	3	0	3	4.5

Fifth Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	CC	BCA501	Software Engineering	3	0	3	4.5
2	CC	BCA502	Web Programming with PHP	3	0	3	4.5
3	CC	BCA503	Network Programming & System Administration	3	0	3	4.5
4	DE*		Elective-I	3	0	3	4.5
5	DE**		Elective-II	3	0	0	3
6	DE***		Elective-III	3	0	0	3
6	PTI		Minor Project	0	0	3	1.5
7.	GSC	GSC501	ESP & SDP-V	0	1	0	1
Total							26.5

Students have to take one mandatory NPTEL course-based on the respective year's offered courses.

Suggestive Choice Based Subjects

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	DE*	BCA504A	Network Security & Cryptography	3	0	3	4.5
2	DE*	BCA504B	Search Engine Optimization	3	0	3	4.5
3	DE**	BCA505A	Mobile Computing	3	0	0	3
4	DE**	BCA505B	Compiler Design	3	0	0	3
5	DE***	BCA506A	Fundamental of Data Analytics	3	0	0	3
6	DE***	BCA506B	Management Information System	3	0	0	3

Sixth Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	CC	BCA601	Artificial Intelligence	3	1	3	5.5
2	DE*		Elective-I	3	1	0	4
3	DE**		Elective-II	0	0	3	1.5
4	PTI	BCA692	Viva-Voce	0	0	3	3
5	PTI	BCA693	Major Project	0	0	6	6
6	PTI	BCA694	Seminar/Internship	0	0	6	3
7.	GSC	GSC601	ESP & SDP-VI	0	1	0	1
Total							24

Students have to take one mandatory NPTEL course-based on the respective year's offered courses.

#Students will undergo project/training/internship in the industry / research organization / reputed Institute during the vacation

Suggestive Choice Based Subjects

Sl No.	Type	Subject Code	Topic	L	T	P	Credit Points
1	DE*	BCA602A	Cloud Computing	3	1	0	4
2	DE*	BCA602B	Distributed System	3	1	0	4
3	DE*	BCA602C	Software Project Management	3	1	0	4
4	DE*	BCA602D	Real Time Operating System	3	1	0	4
5	DE**	BCA693A	Android Programming	0	0	3	1.5
6	DE**	BCA693B	Administration of SQL Server	0	0	3	1.5