School of Engineering

Syllabi and Course Structure

B. Tech. (Computer Science & Engineering)
(2024-2028)
(Full Stack Xebia)
Academic Programmes

June 2024

The curriculum and syllabus for B.Tech. Program conforms to outcome based teaching learning process. In general, several outcomes have been identified and the curriculum and syllabus have been planned in such a way that each of the courses meets one or more of these outcomes. Student outcomes illustrate the students are expected to know and be able to do by the time of graduation. These relate to the skills, understanding, and behavioursthatstudents acquire as they progress through the program. Further each course in the program brings out clear instructional objectives which are mapped to the student outcomes.

B.Tech. (CSE) Program Educational Objective (PEO's):
A graduate of the Computer Science and Engineering Program should:

PEO- I

Students will develop themselves as effective professionals by solving real problems through the use of computer science knowledge and with attention to team work, effective communication, critical thinking and problem solving skills.

PEO- II

Students will develop professional skills that prepare them for immediate employment and for life-long learning in advanced areas of computer science and related fields.

PEO- III

Students will demonstrate their ability to adapt to a rapidly changing environment by having learned and applied new skills and new technologies.

PEO- IV

Students will be provided with an educational foundation that prepares them for excellence, leadership roles along diverse career paths with encouragement to professional ethics and active participation needed for a successful career.

Program Outcome(PO's)

A graduate of the Computer Science and Engineering Program will demonstrate:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal andcultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Culture, Values and Ethics: Understand the importance of culture and Values along with the implications it has on learning, teaching, engineering practice, identity, and enculturation as an engineer. Apply ethical principles being committed to professional ethics, responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering 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.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome:

PSO1: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, cyber security, machine learning and networking for efficient design and automation of computer-based systems of varying complexity. (Professional Skills)

PSO2: The ability to apply standard and modern practices like Python, R language, automation and strategies in software project development using open-ended programming environments to deliver a quality product for business success. (Problem-Solving Skills)

PSO3: The ability to employ modern computer languages, environments, and platforms in creating innovative career paths in the field of AI and Machine learning, Cloud Computing, Robotic automation, cyber security to be an entrepreneur, and a zest for higher studies.(Successful Career and Entrepreneurship)

Course Structure for 2022-2026 Batch

Semester I

Subject Code	Subject	Contact Hours L-T-P	Credits	
DEN001A	*Communication Skills*	2-0-0	2	F
DEN001B	Communication Skills Lab	0-0-2	1	F
DMA001A	*Engineering Mathematics-I **	3-1-0	4	F
DPH001A	*Applied Physics*	3-0-0	3	F
DCO013A	Computer Programming and Logical Thinking	3-0-0	3	F
DPH002A	*Applied Physics Lab*	0-0-2	1	F
BCO370A	Digital Transformation and Agile Development	3-0-0	3	F
DCO014A	Computer Programming and Logical Thinking Lab	0-0-2	1	F
JIC001A	Entrepreneurship Development-I	0-0-2	1	ID
DIN001A	*Culture Education – 1*	2-0-0	2	F
DCH001A/DLW001A	*Environmental Sciences/Indian Constitution/*	2-0-0	NC	F
	TOTAL	**18-1-08**	**21**	

* In semester I common to all sections

NC- Non Credit Course, It is mandatory to clear for completion of degree.

Semester II

Subject Code	Subject	Contact Hours L-T-P	Credits	
DEN002A	Professional Skills	2-0-0	2	F
DEN002B	Professional Skills Lab	0-0-2	1	F
DMA002A	*Engineering Mathematics-II ***	3-1-0	4	F
DCO001A	*Computer Programming in C++**	3-0-0	3	F
BCO371A	Software Craftsmanship	3-0-0	3	F
BCO372A	Software Craftsmanship Lab	0-0-2	1	F
BCO373A	DevOps Engineering(2)	2-0-0	2	F
JIC002A	Entrepreneurship Development- II	0-0-2	1	ID
DCO006A	Engineering Workshop CSE	0-0-2	1	F
DIN 002A	*Culture Education – 2*	2-0-0	2	F
DCO02A	*Computer Programming in C++Lab**	0-0-2	1	F
DCH001A/DLW001A	*Environmental Sciences/Indian Constitution*	2-0-0	NC	F
	TOTAL	**17-1-10**	**21**	

** In semester II common to all sections

B.Tech   CSE   III Semester

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs.	Credits	Type
1	BCO 011A	Computer Networks	3	1	0	4	4	C
2	BCO 002B	Data Structures and Algorithms	3	1	0	4	4	C
3	BAS 007B	Discrete Mathematics	3	0	0	3	3	F
4	BCO 008B	Operating Systems	3	0	0	3	3	C
5	BCO 232A	Software Engineering and Project Management	3	0	0	3	3	F
6	BCO374A	Think Python (3)	3	0	0	3	3	S
7	BCO375A	**Think Python Lab(1)**	0	0	2	2	1	S
8	BCO376A	UI Specialist (3)	3	0	0	3	3	S
9	BCO377A	**UI Specialist Lab (1)**	0	0	2	2	1	S
10	BCO 014B	Operating Systems Lab	0	0	2	2	1	C
11	BCO 005B	Data Structure and Algorithms Lab	0	0	2	2	1	C
12	DEN 003A	Life Skills - 1 (Personality Development)	1	0	2	3	2	F
13	DIN 003A	Value Education and Ethics -1	1	0	0	1	1	F
		Total	**23**	**2**	**10**	**35**	**30**	

B.Tech CSE Semester IV

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs.	Credits	TYPE
1		Open Elective-I	3	0	0	3	3	ID
2	BCO378A	UX Expert with React Redux (2)	2	0	0	2	2	S
3	BCO379A	**UX Expert with React Redux Lab(1)**	0	0	2	2	1	S
4	BCO380A	Backend Development with NodeJS(3)	3	0	0	3	3	S
5	*DCO 003A*	*Programming in Java*	3	0	0	3	3	C
6	BCO381A	**Backend Development with NodeJS Lab(1)**	0	0	2	2	1	
7	BCO 009B	Computer Organization and Design	3	0	0	3	3	C
8	BCO 010C	Database Management Systems	3	1	0	4	4	C
9	BCO094B/ BCO101A	Google Cloud Computing Fundamental/Salseforce	3	0	0	3	3	S
10	BCO 013B	Database Management Systems Lab	0	0	2	2	1	C
11	*DCO04A*	*Programming in Java Lab*	0	0	2	2	1	C
12	DMA 003A	Soft Skills - 2 (Aptitude)	1	0	2	3	2	F
13	DIN 004A	Value Education and Ethics - 2	1	0	0	1	1	F
		Total	**22**	**1**	**10**	**33**	**28**	

B.Tech. CSE Semester V

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs.	Credits	Type
1	BCO 017A	Formal Languages & Automation Theory	3	1	0	4	4	C
2	BCO 023A	Design & Analysis of Algorithms	3	1	0	4	4	S
3	BCO 007A	Computer Graphics	3	0	0	3	3	S
4	BCO382A	Database Engineer- MongoDB (3)	3	0	0	3	3	S
5	BCO383A	**Database Engineer- MongoDB Lab(1)**	0	0	2	2	1	S
6	BCO384A	Test Automation with Selenium (3)	3	0	0	3	3	S
7	BCO385A	**Test Automation with Selenium Lab(1)**	0	0	2	2	1	S
8		Open Elective II	3	0	0	3	3	ID
9	BCO 025B	Design & Analysis of Algorithms Lab	0	0	2	2	1	S
10	BCO 015B	Computer Graphics Lab	0	0	2	2	1	S
		Total	**18**	**2**	**8**	**28**	**24**	

B.Tech CSE Semester VI

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs.	Credits	TYPE
1	BCO 028A	Compiler Construction	3	1	0	4	4	C
2	BCO386A	Microservices & Design Patterns(3)	3	0	0	3	3	S
3	BCO387A	**Microservices & Design Patterns Lab(1)**	0	0	2	2	1	S
4	BCO388A	Monitoring (2)	2	0	0	2	2	S
5	BCO 031B	Compiler Design Lab	0	0	2	2	1	C
6		**Open Elective III**	3	0	0	3	3	ID
7	BCO 074B	Minor Project	0	0	8	8	4	C
		Total	**11**	**1**	**12**	**24**	**18**	

B.Tech. CSE Semester VII

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs.	Credits	Type
1	BCO ****	Department Elective 6	3	0	0	3	3	S
2	BCO ****	Department Elective 7	3	0	0	3	3	S
3	BCO ****	Department Elective 8	3	0	0	3	3	S
4	BCO519A	Project	0	0	6	6	3	C
5	BCO ****	Department Elective 6 lab	0	0	2	2	1	S
6	BCO ****	Department Elective 8 Lab	0	0	2	2	1	S
7	BCO 207A	Technical Writing	0	0	2	2	1	S
		Total	**9**	**0**	**12**	**21**	**15**	

B.Tech. CSE Semester VIII

S. No.	Code	Subject	L	T	P	Contact Hrs.	Credits	Type
1	BCO 034B	Industrial Project/Dissertation	0	0	20	20	20	C
		TOTAL	**0**	**0**	**20**	**20**	**20**	