B.Tech (CS) Course Structure

Semester I	Semester II	Semester III	Semester IV	Semester V	Semester VI	Semester VII	Semester VIII
Introduction to programming	Data Structures	Advanced Programming Language	Database Management System	Computer Networks	Elective II	Elective IV	
Fundamentals of Electronics Engineering	Digital Logic Design	Computer Organization	Operating System	Software Engineering	Elective III	Elective V	
Linear Algebra	Probability & Statistics	Discrete Mathematics	Differential equations & Numerical Methods	Elective I			
Systems Management	Principles of Communication Engineering	Calculus	Design and Analysis of Algorithms				
Professional Communication-I	Professional Communication-II	Theory of Computation	Advanced Computer Architecture	Professional Ethics			

Note: The current pool of electives depends on the availability of the current faculty strength and specializations, which may be appended later.

Pool of Electives
To run the course there must be atleast 15 students

Elective I 1. Convex Optimization 2. Statistical Learning Theory 3. Pattern Recognition 4. Information Retrieval 5. Advanced Data Analytics 6. Natural Language Processing 7. Artificial Intelligence 8. Soft Computing	**Elective II** 1. Computer Vision 2. Visual Recognition 3. Biometrics 4. Pattern Recognition 5. Data Compression 6. Document Image Analysis
Elective III 1. Virtual Reality 2. Advanced Graphics & Animation 3. Pattern Recognition 4. Computer Vision 5. Soft Computing 6. Principles of Interaction Design	**Elective IV** 1. Intrusion Detection System 2. Principles of Cyber Security 3. Information Security & Management 4. Database Security 5. Hardware Security
Elective V 1. Cognition & Cognitive Processes Modeling 2. Wireless Sensor Networks 3. Wireless Networks 4. Internet Of Things 5. Computer Forensics 6. Blockchain & Cryptocurrency	

B.Tech Graduation Requirements

To complete a B.Tech, a student must:

- Earn a minimum of 152 credits (equivalent to 38 full courses, each of 4 credits) over 8 semesters, of these 152 credits, successfully complete all the core courses.
- In the last 4 semesters, do a minimum number of credits (often 32 credits) from the discipline. Remaining credits can be earned by "free electives" in which a student can do discipline or outside the discipline courses.
- A student can do a B.Tech Project, some credits of "Independent Project" or "Independent Study" or "Undergraduate Research", and some credits through online courses.
- In the 6th, 7th and 8th semester, all courses are electives.
- Normally a 4-credit course requires an average effort of about 10 hours per week (including lectures). A student with full load of 5 courses in a semester should expect to put about 50 hours of effort per week during the semester.

Focused Studies and Projects

B. Tech (CS) students may choose any of these options in their 3rd and subsequent years.

- BTP - B. Tech. project
- IS - Independent study
- IP - Independent project
- UR - Undergraduate research

A student needs to have a CGPA of 7.5 or more to register for IS/IP/UR. Normally a student is allowed to register for at most one of IS/IP/UR in one semester, and the combined credit for IS/IP/UR/BTP should not exceed 8 in any semester.

Any B.Tech.(CS) student may register for BTP.
To register for this course, a student needs to first get the consent of the instructor, then fill up the appropriate form and submit it to the BTP Coordinator / Academic office for approval.

Courses and Credits

(1) Every semester the Institute offers some courses, taught by faculty appointed by it.
(2) A course may be of 4, 2, or 1 credit. A registered student who passes a course earns the credits assigned for that course.

a) **A 4-credit course.** The course will have 3 hours of lectures per week, with a total of about 39 hours of lectures (13 weeks). In addition, one hour of interaction per week is expected, which may be in form of structured tutorials. There may also be labs in the course.
b) **A 2-credit course**. The course will have 1.5 hrs lectures per week for the whole semester, or 3 hrs. lectures per week for half the semester. The total lectures hours will be about 20. Intensive short-term courses of 2 credits are also possible, though it is expected that the duration of such a course will not be less than 3 weeks. A 2-credit course may or may not have tutorials and labs.

c) **A 1-credit course**. The course is likely to be run as a short course on a very specialized topic. Such courses may also be run during vacations. A 1-credit course will have a total of about 10 hours of lecture over a period of, generally, not less than 2 weeks.

(3) While taking courses in the Institute is the primary means for a student to earn credits, there may be other approved provisions for earning credit through projects, studying in other Institutions and transferring credits, etc. Such provisions will be provided subject to the approval of the competent authority.

Online Courses
Students can take advantage of the increasing amount of such courses made available by reputed universities across the world to complement the courses offered in the institute.