



B.Tech. Curriculum Structure

(Approved on 6 April 2026)

PREAMBLE

The overall goal of the new B.Tech program is to: (i) Align with NEP 2020 (learner-centric, practice-oriented, multi-disciplinary, problem-solving, flexible, multi-entry multi-exit, etc.) and (ii) Enhance the career prospects of students in industry jobs, higher studies, entrepreneurship or other areas.

1. **Total credit requirement** for B.Tech degree will be 150 (minimum). Students opting for *Honors* or *Minor* degree will take at least 15 additional credits (typically 5 courses), thereby totaling 165 credits.
2. **First year courses** lay the required foundation through science courses (mathematics, physics, etc.) and introduction to engineering (prototyping, programming, etc.). The first two semesters can be swapped, as long as all students complete all courses, for ease of implementation and resource utilization.
3. **Departments are free** to design the curriculum (core courses and lab courses) for 3rd, 4th & 5th semesters, while maintaining the total credits for each semester as indicated. The target ratio of total credits for theory to total credits for labs, for all these three semesters, is 3:2.
4. **Each department** will offer at least 16 UG courses (theory & lab), 6 UG electives and 5 PG core courses for Honors degree (for their own department students). Each department may also offer 5 courses for Minor degree and 2 institute electives, for students from other departments.
5. **Elective courses** must be well-designed, to impart the latest knowledge about a particular technology (such as robotics) or specific industry sector (such as electric vehicles).
6. **Honors program** (minimum 15 credits) is meant for high CGPA students (> 7.5), who are primarily interested in academic or research careers.
7. **Minor program** (minimum 15 credits) can be offered by faculty from multiple departments. It may have CGPA (> 6.5) and/or other entry criteria (say, test, interview or proposal).
8. **Minor program workshops** can be planned in the 3rd semester, for introducing and enabling students to decide which Minor program to take from the 4th semester onward.
9. **Life-skill activities** are integral part of the curriculum, for imparting physical (sports), cultural, technical and professional (communication) skills to the students. Faculty instructors/ coordinators will be assigned for planning, organizing and evaluating each of these activities.
10. **Industry professionals** may be invited to take 10-20% lectures in all courses, especially electives and life-skill activities, to evoke the interest of students and provide practical insights / relevance.
11. **Internship** in industry or R&D organization, relevant to the B.Tech program, can lead to job offers. At most two semesters of internship (9+9=18 credits) is allowed.
12. **Major project** can be aligned with sponsored R&D project (leading to journal or conference paper), or focus on novel product development (leading to patent filing and startup incubation).
13. **Online courses** (SWAYAM / MOOC) equivalent to respective elective/Minor courses in last 3 semesters may be indicated for students who are away from the campus for internship.
14. **Relatively less credits** in the last semester will enable students to complete the total credit requirement, obtain job offers, and publish the major project work or file a patent and prepare their business plan.
15. **Career pathways:** Students can plan and pursue their desired career goals by a suitable combination of industry internship, major project and minor program.
16. **Multiple-exit options** will be provided, leading to a certificate, diploma, and advanced diploma at the end of 1st, 2nd and 3rd year, respectively. Students who have exited the program for any reason will be allowed re-entry within 3 years of exit, to complete the remaining part of program.

B.Tech. Curriculum Structure

1 st Year												
1 st Semester (Physics Group)						2 nd Semester (Chemistry Group)						
Course Name		L-T-P	Credits			Course Name		L-T-P	Credits			
Engineering Physics		3-0-2	4			Engineering Chemistry		3-0-2	4			
Engineering Mathematics - I		3-0-0	3			Engineering Mathematics - II		3-0-0	3			
Computer Programming		0-0-6	3			Data Science and AI		2-0-2	3			
Introduction to Engineering		2-0-2	3			Design Thinking and Prototyping		0-0-6	3			
Biology and Environment		3-0-0	3			Indian Knowledge System		3-0-0	3			
Life-skill activities/labs (4 types)		0-0-8	4			Life-skill activities/labs (4 types)		0-0-8	4			
Total Credits			20			Total Credits				20		
2 nd Year												
3 rd Semester						4 th Semester						
Dept. core course 1		2-1-0	3			Dept. core course 4		2-1-0	3			
Dept. core course 2		2-1-0	3			Dept. core course 5		2-1-0	3			
Dept. core course 3		2-1-0	3			Dept. core course 6		2-1-0	3			
Dept. laboratory course 1		0-0-6	3			Dept. laboratory course 3		0-0-6	3			
Dept. laboratory course 2		0-0-6	3			Dept. laboratory course 4		0-0-6	3			
Dept. core / elective course		3-0-0	3			Life-skill activities/labs (4 types)		0-0-8	4			
Life-skill activities/labs (4 types)		0-0-8	4			Honors / Minor course 1 (optional)		3-0-0	+3			
Total Credits			22			Total Credits				19+3		
3 rd Year												
5 th Semester						6 th Semester						
Dept. core course 7		2-1-0	3			Internship / Major project			9			
Dept. core course 8		2-1-0	3			Dept. / Institute elective 1		3-0-0	3			
Dept. core course 9		2-1-0	3			Dept. / Institute elective 2		3-0-0	3			
Dept. laboratory course 5		0-0-6	3			Life-skill activities/labs (4 types)		0-0-8	4			
Dept. laboratory course 6		0-0-6	3			Honors / Minor course 3 (optional)		3-0-0	+3			
Life-skill activities/labs (4 types)		0-0-8	4									
Honors / Minor course 2 (optional)		3-0-0	+3									
Total Credits			19+3			Total Credits				19+3		
4 th Year												
7 th Semester						8 th Semester						
Internship / Major project			9			Internship / Major project			9			
Dept. / Institute elective 3		3-0-0	3			Dept. / Institute elective 5		3-0-0	3			
Dept. / Institute elective 4		3-0-0	3			Dept. / Institute elective 6		3-0-0	3			
Life-skill activities/labs (4 types)		0-0-2	1			Honors / Minor course 5 (optional)		3-0-0	+3			
Honors / Minor course 4 (optional)		3-0-0	+3									
Total Credits			16+3			Total Credits				15+3		

Credit Distribution

Credit Distribution (Semester-wise)				Credit Distribution (Theory/Practice-wise)			
Year	Odd Sem	Even Sem	Total	Year	Theory	Practice	Total
1	20	20	40	1	22	18	40
2	22	19+3	41+3	2	21+3	20	41+3
3	19+3	19+3	38+6	3	15+6	23	38+6
4	16+3	15+3	31+6	4	12+6	19	31+6
Total	77+6	73+9	150+15	Total	70+15	80	150+15



Life-Skill Labs / Activities

1. PREAMBLE

Students are expected to engage in a variety of co-curricular activities outside the classroom to: (1) develop essential life-skills such as creativity, capability (physical and mental), collaboration and communication, (2) connect with other students in Institute across various disciplines, and (3) become well-rounded individuals and confident professionals. These are in line with key recommendations of the National Education Policy, 2020.

The relevant life-skill activities can be broadly grouped as physical, cultural, technical and professional. Students can explore activities in each group, leading to tangible outputs that can be showcased in Endeavor, Incident, Engineer, Incubate, and similar events elsewhere. These activities are included in the curriculum, assessed, credited and certified. The life-skill activities may be considered similar to teaching labs.

Each life-skill activity will be coordinated by a faculty member. The Activity Coordinator will oversee student registration, communicate with coaches / experts, schedule the engagements, oversee relevant facilities, facilitate assessment and finally give grades for the respective activity. The relevant engagements include guest lectures, demonstrations, tutorials, workshops, exhibitions, competitions (internal or external), etc. The four types of life-skill activities are briefly described here, followed by relevant policies and guidelines.

2. PHYSICAL ACTIVITIES

The cognitive demands and high-pressure environment of modern technical education and professional life need to be balanced by physical activities. By integrating structured physical activity as a credit-bearing requirement, students will be able to alleviate mental stress, improve their focus, develop professional attributes, set and achieve the desired goals, measure self-improvement, and imbibe team-work and leadership skills.

Physical activities involve *indoor and outdoor activities*, to gain physical skills and health. Examples include archery, athletics, badminton, basketball, cricket, cycling, football, gymnastics, handball, hockey, javelin throw, juggling, kabaddi, kayaking, khokho, kung-fu, lawn tennis, NCC, rock climbing, rappelling, shooting, trekking, table tennis, swimming, surfing, volleyball, weight-lifting, Yoga, and various adventure activities.

3. CULTURAL ACTIVITIES

Cultural activities are designed to foster creative expression and emotional intelligence. They inculcate empathy and the ability to understand diverse human needs, essential for user-centered engineering. Students can improve their interpersonal communication, often cited by employers as a critical gap in fresh graduates. Engaging with literature and history builds moral reasoning and sensitivity to the societal impact of technologies such as AI and biotech.

Cultural activities involve *fine arts and performing arts*, for enhancing creativity and mental health. Examples include painting, poetry, photography, animation, film-making, calligraphy, pottery, sculpting, bamboo-craft, paper craft, gardening, culinary arts, music, dancing, dramatics, language (national, international), NSS, fashion design, interior design, toy-making, folk art, debating, quizzing, radio jockey, narrative arts and stand-up comedy.

4. TECHNICAL ACTIVITIES

Technical activities provide a holistic educational experience by combining technical knowledge with creative expression. They involve team-based engineering projects, and 'learning-by-doing' – from initial concept design to prototyping and exhibition or competition. Students will develop curiosity, design thinking, multidisciplinary skills, and collaborative spirit essential for success in their future careers.

Technical activities involve *systems engineering and prototyping*, to hone technical skills. Examples include airplane, glider, drone, submarine, racing car, self-driving vehicle, rocket, satellite, ham radio, astronomy, bionic device, robot, smart home, smart campus, cookware, sanitation, medical device, personal wearable, renewable energy device, plastic recycling, water saving and waste processing, mobile applications for social development, etc.

5. PROFESSIONAL ACTIVITIES

Professional activities aim to build clarity, confidence and professional competence of students by enabling them to communicate effectively in academic, social and professional contexts. Students will learn and practice how to write their resumes, cover letters, and SOPs. The activities also focus on nonverbal communication, oral presentation, interpersonal communication, professional etiquette, employability readiness, group discussions, interviews, and workplace communication.

Professional activities involve giving technical talks for communication skills, at events organized by professional societies or local chapters such as ACM, ASCE, ACS, ASME, ASTM, IEEE, IE, IET, ISTE, SAE, SME, TEDx and Rotaract. Students can also participate in Entrepreneurship Cell activities, business plan competitions, Institute software (IRIS) development, Career Development Centre, etc.

6. ACTIVITIES, LEVELS AND TIME SLOTS

Proposal for a new life-skill activity should include its title, objectives, expected outcomes, pre-requisites (if any), weekly plan of engagements, name of faculty coordinator, external coaches / experts, references, and requirement of resources (equipment, consumables, space). The activities can be partly or fully aligned with existing student clubs and technical societies, if agreeable to all involved.

The proposals will be reviewed by a Deans' committee along with Associate Dean/PIC for sports, cultural, technical, and professional activities. Based on their recommendation (including space and budget), the life-skill activity will be approved by the BoS and Senate.

Each student will participate in four different activities (one in each group – physical, cultural, technical, professional) and master the respective skills over 3-4 years. For this purpose, each life-skill activity will be offered at three levels: 1- Basic, 2- Intermediate, and 3- Advanced, to be taken in the first, second and third year, respectively. Each activity will be limited to 60-80 students, to maintain the desired level of engagement, training and improvement.

Each student will spend at least 2 hours per week (1 credit) per activity, and participate in all four types of activities (that is, 4 credits per semester) from first to sixth semester, and one credit in 7th semester (any of the four activities, based on interest). The total credits for all life-skill activities in the 4-year B.Tech. program will be 25 (out of total 150 credits). Any short-fall in credits (say, due to internship) can be covered up in the last two semesters.

Evening slots in the timetable (4-8 pm) will be reserved for life-skill activities, carried out in sports complex, student activity centre, department labs and any other space allotted by the competent authority. Talks, demonstrations, workshops and exhibitions can be held in seminar halls, lecture halls, auditorium, etc., with prior permission.

7. STUDENT REGISTRATION

Fresh students immediately after joining the Institute and completion of the orientation program will be provided the list of various life-skill activities among each of the four activity groups, and asked to give their preferences based on individual interests. In case the number of students for a particular life-skill activity (at each level) exceeds 60-80, faculty coordinators and experts will assess the interest and capability of each student in their preferred life-skill based on the past experience (certificates, prizes, etc.) and test/ interview, if required, to short-list the most promising students for the particular activity.

Once admitted in a life-skill activity, the students will be required to participate in all scheduled engagements every week. In subsequent semesters, the students will register for the same set of life-skill in the four groups of activities, at progressively higher levels. Only in exceptional cases (such as fail grade or injury), a student may be allowed to change the life-skill activity within the group, with the approval of Dean (Student Welfare).

8. ACTIVITY COORDINATORS

Each group of life-skills activities (physical, cultural, technical and professional) will be guided by an Associate Dean or Professor-In-Charge. Within each group, there will be 15-20 different life-skill activities, each coordinated by a designated faculty member, supported by a suitable staff member (similar to lab staff) and expert/ coach.

Activity Coordinators (faculty) and support staff for each life-skill activity will be identified and selected by a committee comprising three Deans (Student Welfare, Academic Programs, Faculty & Staff Welfare), and Associate Dean/ PICs guiding the four activity groups. Key responsibilities of activity coordinator and support staff will be as follows.

- i. Selection of students for the respective life-skill activity based on their interest and capability.
- ii. Preparing the schedule of engagements and events for each level (basic, intermediate, and advanced).
- iii. Planning the budget to cover relevant expenses, and monitoring them to keep within the approved limit.
- iv. Documenting the participation and performance of all students enrolled in the life-skill activity.
- v. Guiding the students and providing necessary support (through coaches) for performance improvement.
- vi. Assessing the overall participation and performance, and allotting grades at the end of semester.

Relevant expenses include minor equipment/ tools/ kits, consumable materials, honorarium & hospitality for invited experts, organization of exhibitions & events, and travel for student participation in regional/ national competitions. Each activity will be allocated a suitable budget by the Institute based on requirements, track record, and availability of funds. Additional funds for major events (Endeavor, Incident, Engineer, Incubate) may be raised from alumni and corporates, keeping the respective Activity Coordinators in the loop.

9. LIFE-SKILL ASSESSMENT

Life-skills gained by students in the respective activities will be assessed in terms of two components: (i) participation and (ii) performance. Participation will be measured via attendance in scheduled engagements of the particular life-skill activity and assistance in organizing relevant events. Performance will be measured in terms of scores and prizes in internal and external events involving internal and/or external participants. Assessment will be tougher at higher levels of a particular activity. A general framework for the assessment of life-skills is given here, which can be fine-tuned by the faculty coordinators of the respective activities. The marks can be mapped to the double-letter grading system of the Institute.

Components	Factors	Max Marks		
		Level-1	Level-2	Level-3
Participation	1. Attendance in scheduled engagements	50	40	30
	2. Assistance in organizing relevant events	-	10	20
Performance	1. Competition among class-mates	30	20	10
	2. Competition within NITK community	10	20	20
	3. Inter-Institute competition held in NITK	10	10	20
	4. Regional competition held outside NITK	*	*	*
	5. National competition held outside the State	*	*	*
TOTAL		100	100	100

* Talented students can directly compete in regional/national events in lieu of performance items 1-3 and earn respective credits.

10. CONCLUSION

The co-curricular activities enable enhancing the physical, cultural, technical and professional skills of the students, which are critical for success in both professional and personal life. This document provides a starting point for incorporating the activities in the curriculum, and for assessing the students in an objective manner. Any other point not covered in this Policy will be decided by the Activity Coordinator of the respective activity in consultation with the Review Committee mentioned earlier. The Committee is empowered to resolve relevant issues, and communicate to the Director, whose decision will be final and binding on all those involved.