Shree Warana Vibhag Shikshan Mandal's

WARANA UNIVERSITY,
WARANANAGAR

(A State Public University established under Section 3 (6) of MPUA, 2016)

॥ विद्या सर्वस्य भूषणम् ॥

Warana University

Established:2025

Structure & Syllabus For

Bachelor of Technology

F. Y. B. Tech (Semester- I and II)

UNDER

Faculty of Science & Technology

Structure And Syllabus in Accordance With

National Education Policy - 2020

To Be Implemented from Academic Year 2025-26 Onwards
(Common for all Programs)

Preface

The National Education Policy (NEP) 2020 has marked a significant transformation in India's education system, aiming to align higher education with the evolving needs of the 21st century. Warana University is firmly committed to the effective implementation of NEP 2020 in its true spirit, with a strong emphasis on holistic, multidisciplinary, and outcome-based education in accordance with the guidelines of the Government of Maharashtra.

We are pleased to present the First Year B. Tech Syllabus, meticulously crafted to align with the core philosophy of NEP 2020, effective from the Academic Year 2025-26. This curriculum is designed to provide students with a robust foundation in Mathematics and Sciences, while simultaneously integrating Vocational and Skill Enhancement courses, the Indian Knowledge System (IKS), and Co-curricular activities. Our goal is to nurture well-rounded engineers who possess both technical excellence and the adaptability required for global demands.

Special emphasis has been given to experiential learning, where theoretical concepts are reinforced through practical laboratory work, project-based learning, and industry-oriented activities. The syllabus also promotes research, innovation, and entrepreneurship, encouraging students to engage in creative and investigative pursuits from the early stages of their academic journey.

We extend our sincere gratitude to the Chairpersons and members of the various Boards of Studies for their dedicated efforts in designing this forward-looking curriculum.

At Warana University, we believe this syllabus will empower our students with the critical thinking, creativity, and technical proficiency necessary to excel in their professional lives. Warana University looks forward to supporting students in this transformative and enriching academic journey.

Program Outcomes

1. **Engineering Knowledge** Graduates will possess a strong foundation in engineering fundamentals and apply this knowledge to identify, analyze, and solve complex engineering problems. They will be able to understand and apply principles of mathematics, science, and engineering to a variety of real-world situations.
2. **Problem Analysis and Solution Design** Graduates will be able to critically analyze engineering problems and design effective solutions. Using their skills in problem-solving and analytical thinking, they will develop innovative solutions while considering factors such as feasibility, sustainability, and societal impact.
3. **Design and Development of Solutions** Graduates will be able to design and develop solutions for complex engineering problems by selecting and applying appropriate engineering design principles, tools, and techniques. They will also consider ethical, cultural, and environmental aspects in their designs, contributing to sustainable solutions.
4. **Investigation and Research** Students will be equipped with the skills to conduct in-depth investigations and research into engineering problems, using appropriate research methodologies, experiments, and data analysis. This ability will help them to evaluate solutions, optimize designs, and innovate within their field.
5. **Modern Tool Usage** Graduates will be proficient in using modern engineering tools, technologies, and software relevant to their specialization. They will understand the limitations and appropriate application of these tools in solving engineering problems and designing systems, products, and processes.
6. **The Engineer and Society** Graduates will be aware of the impact of engineering solutions on society, the environment, and public safety. They will be equipped to practice engineering in a socially responsible manner, adhering to professional ethics, and contributing positively to the welfare of society.
7. **Environment and Sustainability** Graduates will understand the importance of sustainability and the need to consider environmental impact when designing solutions. They will be capable of creating engineering solutions that promote environmental sustainability, using renewable resources, and minimizing waste and pollution.
8. **Ethics and Professionalism** Graduates will demonstrate professional ethics in their engineering practices, showing integrity, accountability, and social responsibility. They will follow industry standards, uphold ethical decision-making, and work in a manner that reflects the values of the engineering profession.
9. **Teamwork and Communication** Graduates will have strong interpersonal skills, working effectively in multidisciplinary teams. They will communicate ideas and solutions clearly, both in written and oral forms, and be able to collaborate with peers, colleagues, and stakeholders in a professional manner.
10. **Life-Long Learning** Graduates will have a mindset of continuous improvement and lifelong learning. They will be capable of adapting to new technological advancements, seeking out opportunities for professional development, and staying current with industry trends throughout their careers.
11. **Leadership and Innovation** Graduates will demonstrate leadership qualities, take initiative in projects, and contribute to innovative solutions within their field. They will foster creativity, encourage new ideas, and embrace challenges with an entrepreneurial mindset.

Duration

- The B. Tech Program is a **full-time undergraduate program of 4 years**.
- The program is divided into **8 semesters**, each consisting of coursework, laboratory sessions, projects, and industry-oriented activities.

Eligibility

- Candidates must have successfully completed **10+2 / Higher Secondary (or equivalent)** from a recognized board.
- The qualifying examination must include **Physics, Chemistry, and Mathematics (PCM)** as compulsory subjects.
- Admission is based on performance in **national/state-level entrance examinations** (such as JEE Main / State CET / Institute-specific entrance test) as per the rules of the affiliating university and AICTE guidelines.
- Reservation policies (if applicable) are followed as per government norms.

Medium of Instruction

- The **medium of instruction, examinations, assignments, and project reports is English**.

Abbreviations

Sr. No	Acronym	Definition
1	ISE	In-Semester Examination
2	ISE-I	In-Semester Examination-I
3	ISE-II	In-Semester Examination-II
4	ESE	End Semester Examination
5	ISA	In-Semester Assessment (Term Work)
6	L	Lecture
7	T	Tutorial
8	P	Practical
9	CH	Contact Hours
10	C	Credit
11	BSC	Basic Science Course
12	ESC	Engineering Science Course
13	PCC	Program Core Courses
14	HSSM	Humanities Social Science and Management
15	VSEC	Vocational and Skill Enhancement Course
16	CC	Co-curricular course
17	AEC	Ability Enhancement Course
18	IKS	Indian Knowledge System
19	MAC	Mandatory Audit Course

Examination Pattern

The evaluation of a student for each semester shall be based on his/her performance in In-Semester Examination (ISE), In-Semester Assessment (ISA) and End Semester Examination (ESE), Practical and Oral Examination (POE).

In-Semester Examination (ISE)

ISE shall be conducted at the departmental level. There shall be two In-semester tests in each semester for every theory course. Each test shall be of 40 marks (for Communication Skills and Employability Enhancement Skills courses it will be 50 marks) and duration of each test will be 1 hour and 30 minutes. Total In-semester exam marks are calculated as the average of all In-semester exams conducted and are subject to change as per the guidelines of regulatory authorities from time to time.

ISE–I will be conducted on Unit-I and Unit-II whereas ISE–II will be conducted on Unit-III and Unit-IV.

If student failed to score minimum 40% marks, then he/she shall attend Make-up examination. Makeup examination for In-semester examination would be conducted in the same semester for the students who failed to score minimum marks required to pass in In-semester examinations. In-semester examination for absent students on bonafied reason, natural calamity, unpredictable calamity representation of the students in NSS, NCC or such activities will be conducted after the verification of absentee and recommendation from HoD.

However, if a failed student scores more than 16 marks by taking average of maximum of two out of three tests; he/she will be given minimum marks i.e. 16 only. In case of absent students with valid reasons a makeup examination marks would be considered. (If absent in one test; average of attempted test and makeup examination will be considered. For absentee in two tests a decision will be taken after considering the reasons and HoD's recommendations)

In Semester Assessment (ISA):

In-Semester Assessment (ISA) for laboratory courses shall be conducted as a continuous assessment. The assessment shall be based on:

(i) performance of laboratory work,

(ii) submission of experiments in the form of a duly maintained journal/report,

(iii) timely completion of assigned experiments,

(iv) attendance in laboratory sessions, and

(v) demonstrated understanding of the experiments conducted or any other criteria (quiz/ oral exam/case study/ field work/survey/open book test/model preparation/programming/project etc.) specified by course teacher.

End Semester Examination (ESE)

ESE will be based on the entire syllabus and will be conducted for 60 marks and duration of each exam will be 2 hours.

The weightage of the units will be as follows

a) Units not covered under ISE-I or ISE-II will be given 30% weightage each.

b) 10% weightage will be given to each unit included in ISE-I and ISE-II.

Students who have failed in the End Semester Examinations (ESE) of both odd and even semesters within an academic year shall be allowed to appear for the respective Backlog Examinations conducted along with the regular ESE in every semester.

A Re-examination of ESE for all courses (UG and PG) for theory as well as lab courses shall be conducted once in a year before the commencement of an odd semester of the next academic year. For makeup/Re-examination one grade penalty shall be given. There will be no grade penalty for a student getting P grade in makeup/Re-exam examination of ESE.

Grace marks shall not be awarded for makeup/Re-examination of ESE. Exceptions if the student is appearing for first time.

Eligibility criteria for End Semester Examination

A student shall secure a minimum 40% marks in ISE, ISA of a particular course and attendance as per Warana University, Warananagar norms otherwise he/she shall not be eligible for ESE.

Nature of Question Paper :1. General

Q. No.		Marks	BL	CO
1	**Attempt any Four**	**8**		
a	**Unit -1**			
b	**Unit -2**			
c	**Unit -3**			
d	**Unit -4**			
e	**Unit -1/2/3/4**			
f	**Unit -1/2/3/4**			
2	**Attempt All**	**16**		
a	**Unit -1**			
b	**Unit -2**			
c	**Unit -3**			
d	**Unit -4**			
3	**Attempt any Three**	**18**		
a	**Unit -5**			
b	**Unit -5**			
c	**Unit -5**			
d	**Unit -5**			
4	**Attempt any Three**	**18**		
a	**Unit -6**			
b	**Unit -6**			
c	**Unit -6**			
d	**Unit -6**			

2. For Engineering Mechanics

Q. No.		Marks	BL	CO
1	Attempt any Two (Unit 1 to 4)	6		
a		3		
b		3		
c		3		
2	Attempt all (Unit 1 to 4)	18		
a		9		
b		9		
3	Attempt the following	18		
a	Unit -5	10		
b	Unit -5	8		
	OR			
b	Unit -5	8		
4	Attempt any Three	18		
a	Unit -6	10		
b	Unit -6	8		
	OR			
b	Unit -6	8		

3. For Computer Aided Engineering Drawing

Q. No.		Marks	BL	CO
1	Attempt All (Unit 1 to 4)	24		
a		8		
b		8		
c		8		
2	Attempt the following	18		
a	Unit -5	10		
b	Unit -5	8		
	OR			
b	Unit -5	8		
3	Attempt the following	18		
a	Unit -6	10		
b	Unit -6	8		
	OR			
b	Unit -6	8		

Determination of CGPA, Grading and Declaration of result

University has adopted 10-poin tGrading System as follows:

In each semester, marks obtained in each course (Paper) are converted to grade points: If the total marks of course are 100 and passing criteria is 40%, then use the following Table for the conversion.

1. Gradation Chart:

Table

Marks Obtained	Numerical Grade(Grade Point)		CGPA	Letter Grade
Absent	0 (zero)			
0–39	0			
40– 44	4		4.21-4.72	P:Pass
45– 49	5		4.73–5.25	C:Average
50– 59	6		5.26–5.78	B:AboveAverage
60--69	7		5.79--6.31	B+:Good
70--79	8		6.32–7.54	A:VeryGood
80 --89	9		7.55--8.77	A+:Excellent
90--100	10		8.78--10	O:Outstanding

Note:

1. Marks obtained >=0.5 shall be rounded off to next higher digit.
2. The SGPA & CGPA shall be rounded off to 2 decimal points.
3. Marks obtained in 50 marks or 200 marks paper shall be converted to 100 marks.

Calculation of SGPA &CGPA

1.Semester Grade Point Average**(SGPA)**

$$SGPA = \frac{\sum(\text{Course credits} \times \text{Grade points obtained}) \text{ of a semester}}{\sum(\text{Course credits}) \text{of respective semester}}$$

2.CumulativeGradePointAverage**(CGPA)**

$$CGPA = \frac{\sum(\text{Total credits of a semester} \times \text{SGPA of respective semester}) \text{ of all semesters}}{\sum(\text{Total course credits}) \text{of all semesters}}$$

First Year B. Tech Curriculum Structure and Evaluation Scheme

To be implemented as per NEP 2020 from AY 2025 – 26

INSTRUCTIONS

- **There are two groups,** Group A and Group B. 50% of first year B. Tech students will be admitted in Group A and remaining 50% will be in Group B.
- **Audit Course:**

  Democracy, Election and Good Governance is non-credit, self-study audit course.

  A separate examination of 50 marks will be conducted at the end of the semester. Student must score minimum 40% marks in the examination.

Course/ Subject Code for Theory and Practical

2	5	01	U	FYE	BSC/ ESC/ AEC/ CC/ HSSM/ IKS/ MAS/ PCC/ VSEC	1	0	1	T/P/A
Course Introduced Year		Institute Code	Under Graduate	Program Code	Course Category	Semester	Course Number		T-Term work, P-POE A - Audit Course

First Year B. Tech. (Semester – I)
Curriculum Structure and Evaluation Scheme
Group A

Sr.No.	Category	Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
					L	TU	P	CH	C	Component	Marks	Minimum for Passing	
1	Basic Science Course	BSC	2501UFYEBSC101	Engineering Physics	3	-	-	3	3	ISE ESE	40 60	16 24	40
2		BSC	2501UFYEBSC101T	Engineering Physics Lab	-	-	1	2	1	ISA	25	10	
3		BSC	2501UFYEBSC102	Engineering Mathematics-I	3	-	-	3	3	ISE ESE	40 60	16 24	40
4		BSC	2501UFYEBSC102T	Engineering Mathematics-I Tutorial	-	1	-	1	1	ISA	25	10	
5	Engineering Science Course	ESC	2501UFYEESC103	Basic Electrical and Electronics Engineering	2	-	-	2	2	ISE ESE	40 60	16 24	40
6		ESC	2501UFYEESC103T	Basic Electrical & Electronics Engineering Lab	-	-	1	2	1	ISA	25	10	
7		ESC	2501UFYEESC104	Basic Civil Engineering	2	-	-	2	2	ISE ESE	40 60	16 24	40
8		ESC	2501UFYEESC104T	Basic Civil Engineering Lab	-	-	1	2	1	ISA	25	10	
9		ESC	2501UFYEESC105	Computer Aided Engineering Drawing	2	-	-	2	2	ISE ESE	40 60	16 24	40
10		ESC	2501UFYEESC105T	Computer Aided Engineering Drawing Lab	-	-	1	2	1	ISA	25	10	
11	Humanities Social Science and Management	HSSM	2501UFYEHSSM106	Communication Skills	1	-	-	1	1	ISE	50	20	
12		HSSM	2501UFYEHSSM106T	Communication Skills lab	-	-	1	2	1	ISA	25	10	
13	Co-curricular Courses	CC	2501UFYECC107T	Cyber Security Lab	-	-	1	2	1	ISA	50	20	
14	Vocational and Skill Enhancement Course	VSEC	2501UFYEVSEC108T	Manufacturing Techniques Lab	-	-	1	2	1	ISA	50	20	
15	Mandatory Audit Course	MAC	2501UFYEMAC109A	Mandatory Audit Course-I Democracy, Elections and Good Governance*	-	-	-	-	-	-	-	-	
		Total			**13**	**1**	**7**	**28**	**21**	--	**800**	--	

First Year B. Tech. (Semester – II)
Curriculum Structure and Evaluation Scheme
Group A

Sr. No.	Category	Course Category	Course Code	Course Title	Teaching and Credit Scheme (per week)					Examination and Evaluation Scheme			
					L	TU	P	CH	C	Component	Mark	Minimum for Passing	
1	Basic Science Course	BSC	2501UFYEBSC110	Engineering Chemistry	3	-	-	3	3	ISE	40	16	40
										ESE	60	24	
2		BSC	2501UFYEBSC110T	Engineering Chemistry Lab	-	-	1	2	1	ISA	25	10	
3		BSC	2501UFYEBSC201	Engineering Mathematics-II	3	-	-	3	3	ISE	40	16	40
										ESE	60	24	
4		BSC	2501UFYEBSC201T	Engineering Mathematics- II Tutorial	-	1	-	1	1	ISA	25	10	
5	Programme Core Course	PCC	2501UFYEPCC111	Computer Programming in C	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
6		PCC	2501UFYEPCC111T	Computer Programming in C Lab	-	-	1	2	1	ISA	25	10	
7	Engineering Science Course	ESC	2501UFYEESC112	Engineering Mechanics	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
8		ESC	2501UFYEESC112T	Engineering Mechanics Lab	-	-	1	2	1	ISA	25	10	
9		ESC	2501UFYEESC113	Basic Mechanical Engineering	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
10		ESC	2501UFYEESC113T	Basic Mechanical Engineering Lab	-	-	1	2	1	ISA	25	10	
11	Indian Knowledge System	IKS	2501UFYEIKS114T	Indian Knowledge System	1	-	-	1	1	ISA	50	20	
12	Humanities Social Science and Management	HSSM	2501UFYEHSSM202	Employability Enhancement Skills	1	-	-	1	1	ISE	50	20	
13		HSSM	2501UFYEHSSM202T	Employability Enhancement Skills Lab	-	-	1	2	1	ISA	25	10	
14	Co-curricular Courses	CC	2501UFYECC115T	Inquisitive Learning	-	-	1	2	1	ISA	25	20	
										Presentation	25		
		Total			**14**	**1**	**6**	**27**	**21**	--	**800**	--	

First Year B. Tech. (Semester – I)
Curriculum Structure and Evaluation Scheme
Group B

Sr. No.	Category	Course Category	Course Code	Course Title	Teaching and Credit Scheme (per week)					Examination and Evaluation Scheme			
					L	TU	P	CH	C	Component	Marks	Minimum for Passing	
1	Basic Science Course	BSC	2501UFYEBSC110	Engineering Chemistry	3	-	-	3	3	ISE	40	16	40
										ESE	60	24	
2		BSC	2501UFYEBSC110T	Engineering Chemistry Lab	-	-	1	2	1	ISA	25	10	
3		BSC	2501UFYEBSC102	Engineering Mathematics-I	3	-	-	3	3	ISE	40	16	40
										ESE	60	24	
4		BSC	2501UFYEBSC102T	Engineering Mathematics- I Tutorial	-	1	-	1	1	ISA	25	10	
5	Programme Core Course	PCC	2501UFYEPCC111	Computer Programming in C	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
6		PCC	2501UFYEPCC111T	Computer Programming in C Lab	-	-	1	2	1	ISA	25	10	
7	Engineering Science Course	ESC	2501UFYEESC112	Engineering Mechanics	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
8		ESC	2501UFYEESC112T	Engineering Mechanics Lab	-	-	1	2	1	ISA	25	10	
9		ESC	2501UFYEESC113	Basic Mechanical Engineering	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
10		ESC	2501UFYEESC113T	Basic Mechanical Engineering Lab	-	-	1	2	1	ISA	25	10	
11	Humanities Social Science and Management	HSSM	2501UFYEHSSM106	Communication Skills	1	-	-	1	1	ISE	50	20	
12		HSSM	2501UFYEHSSM106T	Communication Skills Lab	-	-	1	2	1	ISA	25	10	
13	Indian Knowledge System	IKS	2501UFYEIKS114T	Indian Knowledge System	1	-	-	1	1	ISA	50	20	
14	Co-curricular Courses	CC	2501UFYECC115T	Inquisitive Learning	-	-	1	2	1	ISA	25	20	
										Presentation	25		
15	Mandatory Audit Course	MAC	2501UFYEMAC109A	Mandatory Audit Course-I Democracy, Elections and Good Governance*	-	-	-	-	-	-	-	-	
		Total			**14**	**1**	**6**	**27**	**21**	--	**800**	--	

First Year B. Tech. (Semester – II)
Curriculum Structure and Evaluation Scheme
Group B

Sr. No	Category	Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
					L	TU	P	CH	C	Component	Marks	Minimum for Passing	
1	Basic Science Course	BSC	2501UFYEBSC101	Engineering Physics	3	-	-	3	3	ISE	40	16	40
										ESE	60	24	
2		BSC	2501UFYEBSC101T	Engineering Physics Lab	-	-	1	2	1	ISA	25	10	
3		BSC	2501UFYEBSC201	Engineering Mathematics-II	3	-	-	3	3	ISE	40	16	40
										ESE	60	24	
4		BSC	2501UFYEBSC201T	Engineering Mathematics-II Tutorial	-	1	-	1	1	ISA	25	10	
5	Engineering Science Course	ESC	2501UFYEESC103	Basic Electrical and Electronics Engineering	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
6		ESC	2501UFYEESC103T	Basic Electrical & Electronics Engineering Lab	-	-	1	2	1	ISA	25	10	
7		ESC	2501UFYEESC104	Basic Civil Engineering	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
8		ESC	2501UFYEESC104T	Basic Civil Engineering Lab	-	-	1	2	1	ISA	25	10	
9		ESC	2501UFYEESC105	Computer Aided Engineering Drawing	2	-	-	2	2	ISE	40	16	40
										ESE	60	24	
10		ESC	2501UFYEESC105T	Computer Aided Engineering Drawing Lab	-	-	1	2	1	ISA	25	10	
11	Humanities Social Science and Management	HSSM	2501UFYEHSSM202	Employability Enhancement Skills	1	-	-	1	1	ISE	50	20	
12		HSSM	2501UFYEHSSM202T	Employability Enhancement Skills Lab	-	-	1	2	1	ISA	25	10	
13	Co-curricular Courses	CC	2501UFYECC107T	Cyber Security Lab	-	-	1	2	1	ISA	50	20	
14	Vocational and Skill Enhancement Course	VSEC	2501UFYEVSEC108T	Manufacturing Techniques Lab	-	-	1	2	1	ISA	50	20	
		Total			**13**	**1**	**7**	**28**	**21**	--	**800**	--	