

**B.TECH – ROBOTICS AND ARTIFICIAL INTELLIGENCE**

**CURRICULUM I TO VIII:**

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	8
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	76
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	-----
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		162
10	Value Added Course (Optional)	VAC	20

No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	I	II	III	IV	V	VI	VII	VIII	Total
<b>Credits</b>	17	21	22	22	23	23	15	17	160
<b>Activity</b>		50					50		---
<b>Points</b>									
<b>Credits for</b>				2					2
<b>Activity</b>									
<b>G.Total</b>									162

**Basic Science Courses:** Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

**Engineering science courses:** Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, Design Engineering, Materials Engineering etc.

**Humanities and Social Sciences including Management courses:** English, Humanities, Professional Ethics, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc

**Mandatory non-credit courses:** Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

### Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like E C L 2 0 1. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the Table 1.

Table 1: Code for the courses

Code	Description
T	Theory based courses (other the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major, Mini Projects)
Q	Seminar Courses

**Course Number** is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

### Departments

SL NO	Department	Course Prefix	SL NO	Department	Course Prefix
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT

5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
	Computer Science (Artificial Intelligence)				
12	Intelligence)	CA	31	Mechanical (Prod)	MP
	Computer Science (Artificial Intelligence & Machine Learning)				
13	Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
	Computer Science (Data Science)				
14	Computer Science (Data Science)	CD	33	Physics	PH
	Computer Science Cyber Security				
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
	Electronics & Biomedical Electronics &				
16	Electronics & Biomedical Electronics &	EB	35	Production Engg	PE
	Communication				
17	Communication	EC	36	Robotics and Automation	RA
	Electrical and Computer Engineering				
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
	Electrical & Electronics				
19	Electrical & Electronics	EE			

#### SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
1/2					
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
1/2					
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
1/2					
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 101	LIFE SKILLS	2-0-2	4	--
S	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
1/2					

	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
1/2					
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
		TOTAL		23/24 *	17

\*Minimum hours per week

Note: To make up for the hours lost due to induction program, one extra hour may be allotted to each course

#### SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
1/2					
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
1/2					
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
1/2					
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
1/2					
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
1/2					
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
		TOTAL		28/29	21

1. Engineering Physics A and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics A in S1 and Engineering Chemistry in S2 & vice

versa. Students opting for Engineering Physics A in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.

2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.

3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1. Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4 Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5 Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

### SEMESTER III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0	4	4
B	RAT 201	PROCESSING AND PROPERTIES OF MATERIALS	4-0-0	4	4
C	RAT 203	ELECTRONIC DEVICES AND CIRCUITS	3-1-0	4	4

D	RAT 205	DIGITAL ELECTRONICS	3-1-0	4	4
E	EST 200	DESIGN & ENGINEERING	2-0-0	2	2
1/2	HUT 200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN 201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	RAL 201	MACHINE DRAWING AND SOLID MODELLING LAB	0-0-3	3	2
T	RAL 203	ELECTRONIC CIRCUITS AND DIGITAL ELECTRONICS LABORATORY	0-0-3	3	2
R/M	VAC	REMEDIAL/MINOR COURSE	3-1-0	4 *	4
			TOTAL	26/30	22/26