SAHRDAYA AUTONOMOUS
COLLEGE OF ENGINEERING & TECHNOLOGY
A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY | MANAGED BY IRINJALAKUDA DIOCESAN EDUCATION TRUST
Approved by AICTE & Affiliated to APJ Abdul Kalam Technological University | Accredited by:
Estd.2002

B. Tech

Curriculum (2024) - Semester I to VIII

Electronics and Communication Engineering

Branch Code: ECE

(SHR/AC/Auto/Acad. Council/B.Tech/2/Curri. /ECE/R1)

Recommended by BoS on 30/08/2024

Approved by Academic Council on 31/08/2024

Amendments Recommended by BOS on 12/06/2025

Amendments Approved by Academic Council on 05/07/2025

Preface to the Curriculum

The B.Tech. Electronics and Communication Engineering (ECE) curriculum is meticulously drafted to cultivate industry-ready professionals endowed with creativity and innovative thinking. This comprehensive curriculum includes induction programs, core and elective courses, practical courses, projects, internships, skill enhancement courses, and extracurricular activities. Designed to total 170 credits, the curriculum ensures a holistic education that prepares students for the dynamic field of Electronics and Communication. Below is a detailed overview of the curriculum's salient features:

1. **Project-Based Learning Courses:** From the first semester to the fifth semester, one course integrated with Project-Based Learning **(PBL)** empowers students with creativity, engaging them in meaningful projects to learn, explore, and investigate. PBL promotes teamwork and collaboration, essential skills for any professional, by having students work together in teams, each contributing unique skills and perspectives to achieve a common goal.
2. **Skill Enhancement Courses**: These courses are designed to provide students with industry-relevant certifications from reputed organizations, enhancing their employability by certifying their skill sets. They are integral to the academic curriculum and offered from Semester 1 to Semester 5, each carrying one credit.
3. **Foreign Language Courses**: To prepare students for global careers, the curriculum includes options to learn foreign languages, promoting cross-cultural communication skills and international collaboration. These courses are available in the seventh semester.
4. **Program Electives and Micro Specializations**: Students can pursue micro-specializations by completing thematic courses, which allow them to gain in-depth knowledge in specific sub-areas of their discipline. Starting in the fourth semester, this provides an opportunity for focused learning and expertise in emerging fields in alignment with program elective courses.
5. **Industry Elective Courses**: Offered jointly with industry partners, these courses ensure relevance and practical applicability. The academic department and industry partners develop and assess them collaboratively, without end-semester examinations, ensuring continuous and practical learning experiences.
6. **Startups and Entrepreneurial Skills**: The curriculum encourages students to pursue startups, offering options to engage in product-based or service-based startups during their seventh and eighth semesters. This fosters innovation, creativity, and entrepreneurial skills, preparing students for the dynamic business environment.
7. **Courses Embedded with Practicals**: The curriculum includes theory courses embedded with practicals and projects, ensuring that students apply theoretical knowledge to real-world problems. This hands-on approach enhances learning outcomes and practical skills.
8. **Internships**: The program includes mandatory internships, allowing students to gain industry exposure and practical experience. Students can undertake at least four to

six months of internship in a recognized industry, research organization, or prestigious institution relevant to their field. This bridges the gap between academic learning and industry requirements, enhancing employability.

9. **Community Work, Social Responsibility, and Universal Human Value Courses**: The curriculum integrates opportunities for community work and socially relevant projects, promoting civic responsibility and leadership skills. Universal Human Value courses also aim to cultivate a holistic understanding of life, enhancing physical and mental well-being and social and life skills. These courses address various dimensions of life, including individual, family, society, and the environment, promoting a healthy and harmonious lifestyle.
10. **Activity Points**: In addition to academic credits, students must earn activity points through participation in extracurricular activities such as sports, cultural events, community service, and entrepreneurship. This holistic approach ensures the development of leadership, teamwork, and communication skills, preparing students for global challenges.
11. **MOOC Courses:** Students selected for internships can fulfill their credit requirements in the seventh and eighth semesters through MOOC courses, providing flexibility and additional learning opportunities.
12. **Higher Credit Elective:** These courses carry more than the standard credit weight of elective courses. They allow students pursuing Honours to reduce the number of required courses by earning additional credits through higher-credit electives. Additional credits earned from higher credit electives can be credited towards the total credit requirement of the Honours program, with a maximum of 12 additional credits being applied towards the Honours credit requirement.

This curriculum seamlessly blends theoretical knowledge with practical experience, fosters interdisciplinary learning, and enhances employability through hands-on projects and internships, preparing students for successful electronics and communication engineering careers.

General Course Structure

1. Credit and Courses:

Credits are a unit of measurement for coursework and are based on the number of hours of instruction required per week. One hour of classroom lecture (L) that is 60 minutes long per week carried out during all weeks of the semester, is considered one Instructional Unit or one Credit. The same goes for a tutorial (T) or a project (R) that is 60 minutes long per week and carried out during all weeks of the semester. In addition, a minimum of 120 minutes per week of laboratory session, practical or fieldwork, training (P) or a combination of these, carried out during all weeks of the semester, is also considered one Instructional Unit or one Credit.

Classification	Credit assigned
1 Hour Lecture [L] per week	1 Credit
1 Hour Tutorial [T] per week	1 Credit
1 Hour Project [R] per week	1 Credit
1-2 Hours Practical [P] per week	1 Credit
3-4 Hours Practical [P] per week	2 Credit

- *For internship/Start-Up/Main project/Mini project, the credit weightage for equivalent hours is 50% of that for lectures/tutorials*

2. Course Category and Credits

The B.Tech. program curriculum has 168 academic credits and 2 additional pass/fail credits that can be gained through 100 activity points. The program is expected to accommodate courses from other disciplines so that students have multi-disciplinary exposure. Additionally, the program should provide sufficient opportunities for students to enhance their communication, soft, managerial, and technical skills. Depending on the program, the courses should fall under the engineering, basic science, humanities science, and management categories. The structure of the UG program should essentially have the following categories of courses with the breakup of credits as given:

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management Courses	HMC	9
2	Basic Science Courses	BSC	20
3	Engineering Science Courses	ESC	26
4	Programme (Professional) Core Courses	PCC	52
5	Programme (Professional) Core Courses-Project Based Learning	PBL	16
6	Program Elective Courses	PEC	18
7	Open Elective Courses/Industry Linked Elective	OEC/ILE	9
8	Project Work and Seminar	PS	12
9	UHV and Community Work	PW	1
10	Skill Enhancement Courses	SEC	5
11	Mandatory Student Activities.	MSA	2
	Total Mandatory Credits	**170**	

A 10% to 15 % deviation in credits is permitted under each discipline. While developing the curriculum, the department offering the program should ensure that the students attain the above distribution upon completing their program. Either Minor or Honours can be opted from the optional specialization.

The courses are organized into 1/2/3/4 credit courses based on the content delivery

mechanism and desired depth of the course. The delivery methods include Theory-only, Theory with tutorial, Theory with practice, Theory with project etc. The L-T-P-R notation for each course signifies the allocation of hours for content delivery in terms of Lecture (L), Tutorial (T), Practical (P), and Project (R) per week, as well as the credit earned from the course. The L-T-P- R-C for each course indicates the number of credits delivered as Lecture (L), Tutorial (T), Practical (P), Project (R) and the total instructional delivery indicated as Credits (C).

$$C = L + T + [P/2] + R$$

Apart from lectures, tutorials, practical/practice and project hours, the curriculum offers Self-learning hours (S) that indicate the number of hours students are expected to spend for activities that should be completed outside the class defined by the faculty handling courses. The activities aim to support learning and should be initiated by the students themselves without guidance or direction from tutors. For each course, the self-learning hour per week is calculated as:

$$S= (L*1.5+T*0.5+P*0.5+R*1)$$

In line with the National Credit Framework, one credit is equivalent to 30 hours of total student engagement, which includes: Direct instructional hours (L, T, P, R) and associated self-learning hours (S).

Categories of courses included in the curriculum and their L-T-P-R-C components are given in the table below:

Sl. No.	Lecture- Tutorial- Practical- Project [L-T-P-R]	Credit [C]	Description
1.	1-0-2-0	2	Theory course without End Semester Examination [ESE]
2.	1-0-0-0	1	
3.	2-0-2-1	4	Theory course embedded with practical and project
4.	3-1-0-0	4	Theory course embedded with tutorial
5.	3-0-0-0	3	Theory course
6.	2-0-0-0	2	
7.	3-0-2-0	4	Theory course embedded with practical
8.	3-0-0-1	4	Theory course embedded with project
9.	0-0-2-0	1	Practical course without ESE
10.	0-0-3-0	2	Practical course
11.	0-0-0-3	2	Mini Project
12.	0-0-3-0	2	Seminar
13.	0-0-0-8	4	Major Project/Internship/Start-Up
14.	0-0-0-0	1	MOOC Course
Mandatory Courses			
15.	0-0-2-0	1	Skill Enhancement Courses
Minor/ Honours Course			
16.	4-0-0-0	4	Theory course

17.	0-0-0-4	4	Project only course

3. Course Code

Every course of B. Tech. The program shall take a code from the table given below.

Course category	Description
PCC	Program (Professional) Core Courses
PBL	Project Based Learning
CLT	Combined Lab Theory
PEC	Professional Elective Course
OEC	Open Elective Course
BSC	Basic Science Course
ESC	Engineering Science Course
HMC	Humanities, Social Sciences and Management course
MOOC	MOOC Course
IEL	Industry Elective Course
PW	Socially Relevant course
PS	Project Work and Seminar
SEC	Skill Enhancement Courses
HR	Honours
MR	Minor

Structure of Course Code: Each course will be identified by a unique Course Code consisting of eight alphanumeric characters, formatted as **24XXYABC**. The code can be interpreted as follows: "24" represents the regulation year, "XX" is the course category code, "Y" indicates the course delivery mode, "A" is the semester number (ranging from 1 to 8, with 0 indicating the course is offered in both odd and even semesters), "B" denotes the version of the course under each category, and "C" signifies the course sequence number.

For example, 24CET303 is a theory course offered by the civil engineering department in the third semester of the 2024 scheme.
24BML408 - laboratory course offered by the biomedical engineering department in the fourth semester of the 2024 scheme
The detailed expansion of the abbreviation of the course code structure is listed in the table below:

XX	Y	A	B	C
Course category	Course delivery mode	Semester No	Version of the course	Serial No: of course

BM-Biomedical Engineering BT-Biotechnology CE – Civil Engineering CS-Computer Science Engineering EC-Electronics and Communication Engineering EE-Electrical and Electronics Engineering MA-Mathematics CY – Chemistry PH-Physics ES-Engineering Science course HU-Humanities and Management Courses SE-Skill Enhancement Courses PW-Social Science and Community work	T-Theory L-Laboratory R-Theory Embedded with Project K-Certification Course E-Elective Course G- Minor H-Honours M-MOOC O-Open Elective I-Industry Elective S-Seminar P-Project N-Internship U-Start Up C – Theory Embedded with practical	0 1 2 3 e t c .	1 2 3 etc.	1 2 3 4 5 6 etc .

Syllabus Revision (R#):

• If a syllabus is amended or modified, a revision identifier will be appended to the course code in the format R#, where # represents the revision number.

• A maximum of three revisions (R1, R2, R3) are allowed for a course within a single regulation period.

For example, 24CET303R1 indicates the first revision of the original course 24CET303, reflecting an updated or amended syllabus under the 2024 regulation.

4. Allotted and Cumulative Credits

The allotted and cumulative credits are given in the table below:

Semester	Allotted Credits	Cumulative Credits
First	21	-
Second	22	43
Third	26	69
Fourth	24	93
Fifth	24	117
Sixth	23	140
Seventh	17	157
Eighth	11	168

FIRST SEMESTER (July-December)													
10 Days Compulsory Induction Program													
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT121	BSC	Linear Algebra, Differential Equations & Laplace transforms	3	0	0	0	40	60	3	3
2	B	24CYC012	BSC-CLT	Engineering Chemistry	3	0	2	0	50	50	4	5
3	C	24EST023	ESC	Fundamentals of Electrical & Electronics Engineering	4	0	0	0	40	60	4	4
4	D	24EST104R1	ESC	Foundations of Computing	3	0	0	0	40	60	3	3
5	F	24ESR105	ESC-PBL	Algorithmic Thinking with Python	2	0	2	1	50	50	4	5
6	L	24ESL006	ESC	Basic Electrical and Electronics Engineering Workshop	0	0	2	0	50	---	1	2
7	I*	24HUT007	HMC	Communicative English	0	0	2	0	100	--	1	2
8	J*	24SEC10N	SEC	Skill Enhancement Course 1							1	
Total											**21**	**24**

SECOND SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT221	BSC	Infinite series, Multiple integrals & Vector Calculus	3	0	0	0	40	60	3	3
2	B	24PHC222	BSC-CLT	Physics for Electrical Science	3	0	2	0	50	50	4	5
3	C	24ESC003	ESC	Engineering Graphics	3	0	0	0	40	60	3	3
4	D	24EST204	ESC-CLT	Programming in C	3	0	2	0	50	50	4	5
5	E	24ECR205	PCC-PBL	Network Theory	3	0	0	1	50	50	4	4
6	I*	24HUT006	HMC	Professional ethics and sustainable development	1	0	2	0	100	--	2	2
7	L	24ESL007	ESC	Computer Aided Drawing (CAD) & Manufacturing Workshop	0	0	2	0	50	---	1	2
9	J*	24SEK10N	SEC	Skill Enhancement Course 2							1	
Total											**22**	**26**

No Grade Points will be awarded for the MOOC and J slot courses
The self-learning (S) hours for each course is calculated based on the formulae,
S= (L*1.5+T*0.5+P*0.5+R*1)

THIRD SEMESTER (July-December)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**			**Total Marks**			**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT321	BSC	Complex Analysis and Partial Differential Equations	3	0	0	0	40	60	3	3
2	B	24ECT302	PCC	Analog Circuits	3	1	0	0	40	60	4	4
3	C	24ECT303	PCC	Solid State Devices	3	1	0	0	40	60	4	4
4	D	24ECR304	PCC-PBL	Logic Circuit Design	3	0	0	1	50	50	4	4
5	E	24HUT005	HMC	Engineering Economics	2	0	0	0	50	50	2	2
6	F	24EST306	ESC	Applied Data Science & Artificial Intelligence	3	1	0	0	40	60	4	4
7	L	24ECL307	PCL	Analog Circuits Lab	0	0	3	0	50	50	2	3
8	Q	24ECL308	PCL	Logic Circuit Design Lab	0	0	3	0	50	50	2	3
9	J*	24SEK10N	SEC	Skill Enhancement Course 3							1	
10	R/ M	24ECG3XX	VAC	Remedial/Minor Course							4*	4*
Total											**26/ 30***	**27/ 31***

FOURTH SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT421	BSC	Probability Distributions, Numerical Methods and Transforms	3	0	0	0	40	60	3	3
2	B	24ECT402	PCC	Signals and Systems	3	1	0	0	40	60	4	4
3	C	24ECT403	PCC	Linear Integrated Circuits	3	1	0	0	40	60	4	4
4	D	24ECR404	PCC-PBL	Microcontrollers & Embedded Systems	3	0	0	1	50	50	4	4
5	F	24ECE41N	PE	PE-1	3	0	0	0	40	60	3	3
6	L	24ECL406	PCL	Linear Integrated Circuits Lab	0	0	3	0	50	50	2	3
7	Q	24ECL407	PCL	Microcontroller Lab	0	0	3	0	50	50	2	3
8	I*	24PWT208	PW	UHV II, Life Skills & Community work	1	0	0	0	100	--	1	1
9	J*	24SEK10N	SEC	Skill Enhancement Course 4							1	
10	R/M/H	24ECG4XX/ 24ECH4XX	VAC	Remedial/Minor/ Honours Course							4*	4*
Total											**24/ 28***	**25/ 29***

PROGRAM ELECTIVE I: 24ECE41N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
F	24ECE411	Electronic Instrumentation	3-0-0-0	3	3
	24ECE412	Power Electronics	3-0-0-0		3
	24ECE413	Sensors and Actuators	3-0-0-0		3
	24ECE414	Machine Learning	3-0-0-0		3
	24ECE415	Digital Systems and VLSI Design	3-0-0-0		3
	24ECE416	Object Oriented Programming#	3-1-2-0	6	5

 # Higher credit elective

FIFTH SEMESTER (July-December)													
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24ECT501	PCC	Digital Signal Processing	3	1	0	0	40	60	4	4
2	B	24ECT502	PCC	Analog and Digital Communication	3	1	0	0	40	60	4	4
3	C	24ECT503	PCC	Electromagnetics	3	0	0	0	40	60	3	3
4	D	24ECR504	PCC-PBL	VLSI Circuit Design	3	0	0	1	50	50	4	4
5	E	24ECE52N	PE	PE-2	3	0	0	0	40	60	3	3
6.	I*	24HUM506	HMC	Constitution Of India (MOOC)	-	-	-	-	-	-	1	-
7.	L	24ECL507	PCL	Digital Signal Processing Lab	0	0	3	0	50	50	2	3
8.	Q	24ECL508	PCL	Analog and Digital Communication Lab	0	0	3	0	50	50	2	3
9.	J*	24SEK10N	SEC	Skill Enhancement Course 5							1	
10.	R/M/H	24ECG5XX/ 24ECH5XX	VAC	Remedial/Minor/ Honours							4*	4*
	S_5/ S_6	Industrial Visit (Maximum 10 Days are permitted, Not Exceedingly more than 5 Working Days) /Industrial Training										
Total											**24/ 28***	**24/ 28***

PROGRAM ELECTIVE 2: 24ECE52N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
C	24ECE521	Biomedical Engineering	3-0-0-0	3	3
	24ECE522	Electronic Product Design	3-0-0-0		3
	24ECE523	ARM Architecture and Programming	3-0-0-0		3
	24ECE524	Optimization Techniques	3-0-0-0		3
	24ECE525	Data Structures	3-0-0-0		3
	24ECE526	Testing and Verification using System Verilog	3-0-0-0		3
	24ECE527	High-speed Electronics #	3-2-0-0	5	5

 # Higher credit elective

SIXTH SEMESTER (January-June)													
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24ECT601	PCC	Control Systems	3	1	0	0	40	60	4	4
2	B	24ECT602	PCC	Microwave & Antenna	3	0	0	0	40	60	3	3
3	C	24ECE63N	PE	PE-3	3	0	0	0	40	60	3	3
4	D	24ECC604	PCC-CLT	Digital System Design	3	0	2	0	50	50	4	5
5	F	24EST605	ESC	Design Thinking and Product Development	2	0	0	0	50	50	2	2
6	O	24XXO61N /24XXI61N	OE/ ILE	OE/ILE-1	3	0	0	0	40	60	3	3
7	L	24ECL607	PCL	Microwave & Antenna Laboratory	0	0	3	0	50	50	2	3
8	P	24ECP608	PS	Mini Project	0	0	3	0	100	--	2	3
9	R/M /H	24ECG6XX/ 24ECH6XX	VAC	Remedial/Minor/Honours Course	3	1	0	0			4*	4*
	S5/ S6	Industrial Visit (Maximum 10 Days are permitted, Not Exceedingly more than 5 Working Days) /Industrial Training										
Total											**23/ 27***	**26/ 30***

Note: Open Electives are such courses that other departments will offer

PROGRAM ELECTIVE 3: 24ECE63N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
A	24ECE631	Digital Image Processing	3-0-0-0	3	3
	24ECE632	Robotics	3-0-0-0		3
	24ECE633	Nano electronics	3-0-0-0		3
	24ECE634	Optical Communication	3-0-0-0		3
	24ECE635	Low Power VLSI	3-2-0-0	5	5

OPEN ELECTIVE 1: 24ECO61N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
O	24ECO611	Optimization Techniques for Electronic Systems	3-0-0-0	3	3
	24ECO612	Computer Networks	3-0-0-0		3
	24ECO613	Entertainment Electronics	3-0-0-0		3
	24ECO614	Information Security	3-0-0-0		3
	24EC0615	Robotics	3-0-0-0		3

SEVENTH SEMESTER (July-December)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24ECE74N/ 24ECM74N	PE	PE-4 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
2	B	24ECE75N/ 24ECM75N	PE	PE-5 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
3	O	24XXO72N/ 24XXI72N/ 24XXM73N	OE/ ILE	OE/ILE-2 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
4	I*	24HUT704/ 24HUM70N	HMC	Elective (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2	0	0	0	50	50	2	2
5	S	24ECS705	PS	Seminar	0	0	3	0	50	0	2	3
6	P	24ECP706/ 24ECN706/ 24ECU706	PS	Option 1: Major Project Option 2: Internship (4-6 Months) Option 3: Startup	0	0	0	8	100	0	4	8
7	R/ M/ H	24ECG7XX/ 24ECH7XX	VAC	Remedial/Minor/ Honours Course							4*	4*
Total											**17/ 21***	**22/ 26***

**The students can take the internship option either in 7th or in 8th semester.*
** Option 1: Work on a Project in the institute/department under the mentorship of faculty members.*
Option 2: Full semester Internship in Industry/organization ***(7th or 8th semester)***
Option 3: Full-semester startup if startup is service-based ***(7th or 8th semester)****; full-year startup if startup is product-based* ***(7th or 8th semester)***

PROGRAM ELECTIVE 4: 24ECE74N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
B	24ECE741	Internet of Things	3-0-0-0	3	3
	24ECE742	Information & Coding Theory	3-0-0-0		3
	24ECE743	MEMS	3-0-0-0		3
	24ECE744	Deep Learning	3-0-0-0		3
	24ECE745	Secure Communication	3-0-0-0		3
	24ECE746	Advanced DSP#	3-2-0-0	5	5

PROGRAM ELECTIVE 5: 24ECE75N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
A	24ECE751	Satellite and Radar Communication	3-0-0-0	3	3
	24ECE752	Wireless Communication	3-0-0-0		3
	24ECE753	Big Data Analytics	3-0-0-0		3
	24ECE754	Real-Time Operating Systems	3-0-0-0		
	24ECE755	Speech & Audio Processing	3-0-0-0		3
	24ECE756	Computer Networks	3-0-0-0		3
	24ECE757	Analog & Mixed Signal IC Design	3-2-0-0	5	5

 # Higher credit elective

OPEN ELECTIVE 2: 24ECO72N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
O	24ECO721	Communication Systems in Engineering	3-0-0-0	3	3
	24ECO722	Wireless Mobile Communication	3-0-0-0		3
	24ECO723	Mechatronics	3-0-0-0		3
	24EC0724	Introduction to MEMS	3-0-0-0		3
	24EC0725	Introduction to VLSI Design	3-0-0-0		3

HMC Elective

Slot	Course Code	Courses
I*	24HUT704	Project Management: Planning, Execution, Evaluation and Control
	24HUM701	Proficiency course in French (B1 level) (MOOC)
	24HUM702	Proficiency Course in German (B1 Level) (MOOC)
	24HUM703	Proficiency Course in Spanish (B1 Level) (MOOC)
	24HUM704	Introduction to Japanese Language and Culture (N5 level). (MOOC)

EIGHT SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24ECE86N/ 24ECM86N	PE	PE-6 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
2	O	24XXO83N/ 24XXI83N/ 24XXO84N	OE/ ILE	OE/ILE-3 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
3	I*	24HUT803/ 24HUM803	HMC	Organizational Behavior and Business Communication (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2	0	0	0	50	50	1	2
4	P	24ECP806/ 24ECN806/ 24ECJ806/ 24ECU806	PS	Option 1: Major Project Option 2: Internship (4-6 Months) Option 3: Major Project Phase -II (For the students who have not opted for internship in S7/S8) Option 4: Startup	0	0	0	8	100	0	4	8
5	R/H	24ECH8XX	VAC	Project: Honours Course							4*	4*
Total											**11/ 15***	**16/ 20***

PROGRAM ELECTIVE 6: 24ECE86N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
B	24ECE861	Industrial IOT	3-0-0-0	3	3
	24ECE862	Artificial Intelligence Applications	3-0-0-0		3
	24ECE863	Mechatronics	3-0-0-0		3
	24ECE864	RF engineering	3-0-0-0		3
	24ECE865	ML Accelerator for Edge Computing	3-0-0-0		3
	24ECE866	Estimation and Detection#	3-1-0-1	5	5

 # Higher credit elective

OPEN ELECTIVE 3: 24ECO83N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
O	24ECO831	Optical Communication	3-0-0-0	3	3
	24ECO832	Automotive Electronics	3-0-0-0		3
	24ECO833	IOT & Applications	3-0-0-0		3
	24ECO834	Computer Vision	3-0-0-0		3
	24ECO835	Pattern Recognition	3-0-0-0		3

Micro Specialization

Micro Specialization Group ID	Specialization	Courses
G-I	Artificial Intelligence	Machine Learning
		Optimization Techniques
		Digital Image Processing
		Deep Learning
		Artificial Intelligence Applications
G-II	IoT & Robotics	Sensors & Actuators
		Arm Architecture and Programming
		Robotics
		Internet of Things
		Industrial IoT
G-III	VLSI	Digital Systems and VLSI Design
		Testing and Verification using System Verilog
		Low Power VLSI
		Analog and Mixed IC Design
		ML Accelerator for Edge Computing

HMC Courses				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1/S2**	24HUT007	Communicative English	1
		24HUT006	Professional Ethics and Sustainable Development	2
2	**S3**	24HUT005	Engineering Economics	2
4	**S5**	24HUM506	Constitution of India. (MOOC)	1
5	**S7**	24HUM704/ 24HUM70N	Elective (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2
6	**S8**	24HUT803/ 24HUM803	Organizational Behavior and Business Communication	1
Total Credits				**9**

BSC Courses				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1**	24MAT121	Linear Algebra, Differential Equations & Laplace transforms	3
2	**S1/S2**	24CYC012	Engineering Chemistry	4
3		24PHC222	Physics for Electrical Science	4
4	**S2**	24MAT221	Infinite series, Multiple integrals & Vector Calculus	3
5	**S3**	24MAT321	Complex Analysis and Partial Differential Equations	3
6	**S4**	24MAT421	Probability Distributions, Numerical Methods and Transforms	3
Total Credits				**20**

ESC Courses				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1**	24EST104R1	Foundations of Computing	3
		24ESR105	Algorithmic Thinking with Python-PBL-1	4
2		24EST104	Fundamentals of Electrical & Electronics Engineering	4
3		24ESL006	Basic Electrical and Electronics Engineering Workshop	1
4	**S2**	24EST003	Engineering Graphics	3
5		24ESC204	Programming in C	4
6		24ESL007	Computer Aided Drawing (CAD) & Manufacturing Workshop	1
7	**S3**	24EST306	Applied Data science & Artificial Intelligence	4
8	**S6**	24EST605	Design Thinking and Product Development	2
Total Credits				**26**

Programme Core Courses (PCC)				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S3**	24ECT302	Analog Circuits	4
2		24ECT303	Solid State Devices	4
3		24ECL307	Analog Electronics Lab	2
4		24ECL308	Logic Circuit Design Lab	2
5	**S4**	24ECT402	Signals and Systems	4
6		24ECT403	Linear Integrated Circuits	4
7		24ECL406	Linear Integrated Circuits Lab	2
8		24ECL407	Microcontroller Lab	2
9	**S5**	24ECT501	Digital Signal Processing	4
10		24ECT502	Analog and Digital Communication	4
11		24ECT503	Electromagnetics	3
12		24ECL507	Digital Signal Processing Lab	2
13		24ECL508	Analog and Digital Communication Lab	2
14	**S6**	24ECT601	Control Systems	4
15		24ECT602	Microwaves & Antenna	3
16		24ECC604	Digital System Design	4
17		24ECL607	Microwave & Antenna Laboratory	2
Total Credits (Theory -10, Lab-7)				**52**

Programme Core-Project Based Learning (PBL)				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
2	**S2**	24ECR205	Network Theory	4
3	**S3**	24ECR304	Logic Circuit Design	4
4	**S4**	24ECR404	Microcontrollers & Embedded Systems	4
5	**S5**	24ECR504	VLSI Circuit Design	4
Total Credits				**16**

Programme Elective Courses (PE)				
Sl. No:	**Semester**	**Course Code**	**Course Type**	**Credits**
1	**S4**	24ECE41N	PE-1	3
2	**S5**	24ECE52N	PE-2	3
3	**S6**	24ECE63N	PE-3	3
4	**S7**	24ECE74N	PE-4	3
5	**S7**	24ECE75N	PE-5	3
6	**S8**	24ECE86N	PE-6	3
Total Credits				**18**

Open Elective Courses/Industry Elective (OE/IEL)

Sl. No:	Semester	Course Code	Course Type	Credits
1	**S6**	24XXO61N/ 24XXI61N	OE/ILE-1	3
2	**S7**	24XXO72N/ 24XXI72N/ 24XXM73N	OE/ILE-2	3
3	**S8**	24XXO83N/ 24XXI83N/ 24XXO84N	OE/ILE-3	3
Total Credits				**9**

Project Work /Seminar				
Sl. No:	**Semester**	**Course Code**	**Course Type**	**Credits**
1	**S6**	24ECP608	Mini Project	2
2	**S7**	24ECS705	Seminar	2
3		24ECP706/ 24ECN706/ 24ECU706/	Project/Internship/Startup	4
4	**S8**	24ECP806/ 24ECN806/ 24ECJ806 24ECU806/	Project/Internship/Startup	4
Total Credits				**12**

UHV and Community Work				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S4**	24PWT208	UHV II, Life Skills & Community Work	1
Total Credits				**1**

Skill Enhancement Course				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1-S5**	24SEK10N	Skill Enhancement Course	5
Total Credits				**5**

Mandatory Student Activities				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**-**	-	Mandatory Student Activities	2
Total Credits				**2**

Total Credits	170

RULES FOR ASSIGNING ACTIVITY POINTS

Apart from technical knowledge and skills, students should have excellent soft skills, leadership qualities and team spirit to be successful as professionals. They should have entrepreneurial capabilities and societal commitment. Student activity points to be earned, covering extracurricular and co-curricular activities, have been specified to nurture these qualities. All students must earn at least 100 activity points from various activity segments listed to qualify for the B.Tech degree. Two credits are given for this on a pass/ fail basis, mandatory for getting the B.Tech Degree. As no grade for these two credits is given, they are not included in the CGPA calculation. For lateral entry students joining from the third semester, the activity point requirement is 75 Points earned by the student, which will be indicated in the consolidated academic statement. In the case of NSS and NCC, points can be entered after completing a two-year Programme. All documental proof for awarding the activity points should be obtained, and the points will be consolidated. The rules for assigning activity points are given in the following sections. The following table lists the main activity segments, and the maximum points associated with each segment.

Activity Points				
Sl. No.	**Group**	**Courses**	**Credits**	**Minimum Credit Requirements**
1	I	NSS, NCC, NSO (National Sports Organization)	1 (50 Points)	2 Credits (One credit from each Group)
2		Arts/Sports/Games		
3		Union/Club Activities		
4	II	English Proficiency Certification (TOFEL, IELTS, BEC etc.)	1 (50 Points)	
5		Aptitude Proficiency Certification (GRE, CAT, GMAT etc.)/Valid Gate Score		
6		Short Term Internship, Clinical Exposure/Training (Minimum 2 weeks), Conferences/Paper Presentation/ Workshop Activities/ Professional Body Activities/ MOOC Courses/ Entrepreneurship and Innovation		

- ***75% per group for B. Tech Lateral Entry Students***
- ***To obtain the 2 Activity Credits required in the curriculum, students must acquire at least 100 activity points.***

The following table lists the activities under each of these segments, the expected level of achievement, activity points, the evidence needed to assign the points, and the minimum duration required for certain activities. Additional activities under these segments can be considered after approval from the Academic Council.

Group	Activity Head	Sl. No	Activity	Achievement Levels and Assigned Activity Points					** Approval Document	Max. Points	Min. duration of activity
			*Level	I	II	III	IV	V			
GROUP I	National Initiatives Participation	1.	NCC	-	-	-	-	-	a/b	50	2 Year
		2.	NSS	-	-	-	-	-	a/b	50	2 Year
		For a C certificate / outstanding performance supported by certification, additional marks up to 20 can be provided, subject to a maximum limit of 80 points. Best NSS Volunteer Awardee (University level) / Participation in National Integration Camp/ Pre-Republic Day Parade Camp (South India), supported by certification, additional marks up to 10 can be provided, subject to a maximum limit of 70 points. For the best NSS Volunteer Awardee (State / National level), Participation in Republic Day Parade Camp or International Youth Exchange Programme supported by certification, additional marks up to 20 can be provided, subject to a maximum limit of 80 points.									
	Sports & Games Participation	3.	Sports	5	10	20	30	50	a	50	1 Year
		4.	Games	5	10	20	30	50	a	50	1 Year
			First Prize	8	8	8	15	15	Additional points can be provided for winning. The maximum limit for activity points is 60. However, the maximum point limit is enhanced to 80 for Level IV and V winning.		
			Second Prize	5	5	5	12	12			
			Third Prize	3	3	3	9	9			
	Cultural Events	5.	Music	5	10	20	30	50	a	50	1 Year
		6.	Performing arts	5	10	20	30	50	a	50	1 Year
		7.	Literary arts	5	10	20	30	50	a	50	1 Year
			First Prize	8	8	8	15	15	Additional points can be provided for winning. The maximum limit for activity points is 60. But for Level IV and V winning, the maximum point limit is enhanced to 80.		
			Second Prize	5	5	5	12	12			
			Third Prize	3	3	3	9	9			
				Coordinator		**Sub/joint-coordinator**		**Volunteer**			

	Union /Club Activities	8.	Elected student representatives	25 (Chairman)	20 (Secretary)	10 (Members)	d	50	1 Year
		9.	Hobby Clubs	10	5	3	d	30	1 Year
		10.	Placement Activities	10	5	3	d	30	1 Year
		11.	Student Professional Societies (IEEE, IET, ASME, SAE, NASA etc.)	10	5	3	d	30	1 Year
		12.	Department Associations	10	5	3	d	30	1 Year
		13.	Festival & Technical Events (College approved)	10	5	3	d	30	1 Year
GROUP II	14. **Professional Self Initiatives**		**Activity**	**Achievement Levels and Assigned Activity Points**					
			***Level**	**I**	**II**	**III**	**IV**	**V**	
		14.	Tech Fest, Tech Quiz	10	20	30	40	50	a	40	
		15.	MOOC with final assessment certificate (Other than specified in the curriculum)	30					a	40	
		16.	Competitions conducted by Professional Societies - (IEEE, IEI, IET, ASME, SAE, NASA etc.)	5	10	15	20	30	a	30	
		17.	Hackathon	5	10	15	20	30	a	30	
			Additional 10 points for Winners of Smart India Hackathon (SIH)/ India Innovation Challenge Design Contest (IICDC)								
		18.	Attending Full time Conference/ Seminars / Exhibitions/ Workshop/ STTP conducted at IITs /NITs	10					a	20	

		18a	Attending Full time Conference/ Seminars / Exhibitions/ Workshop/ STTP conducted at KTU or its affiliated institutes	4	a	8	
		19.	Paper presentation/ publication at IITs/NITs	15	a	30	
			Additional 10 points for certificate of recognition.				
		19. a	Paper presentation/ publication at KTU or its affiliated institutes	6	a	12	
			Additional 2 points for a certificate of recognition.				
		20.	Poster Presentation at IITs /NITs	8	a	15	
			Additional 10 points for certificate of recognition.				
		20.a	Poster Presentation at KTU or its affiliated institutes	3	a	5	
			Additional 2 points for a certificate of recognition.				
		21.	Industrial Training/ Internship (at least for 2 weeks)	15	a/b	15	
		22.	Industrial/ Exhibition visits	3	a/b/ d	8	
		23.	Foreign Language Skills (TOEFL/ IELTS/ BEC exams, etc.)	40	a	40	
		24.	Aptitude Proficiency Certification (GRE, CAT, GMAT, etc)/Valid Gate Score	40	a	40	
		25.	Skilling Certificates (if not considered as part of the curriculum)	25	a	25	
		26.	Start-up Company Registered	50	d	50	

	Entrepreneurship and Innovation		Legally (if not considered as part of the curriculum)				
		27.	Patent-Filed	25	d	25	
		28.	Patent - Published	30	d	50	
		29.	Patent- Granted (if Grace marks are not awarded)	40	d	50	
		30.	Patent- Licensed	70	d	70	
		31.	Prototype developed and tested	50	d	50	
		32.	Awards for Products developed	50	d	50	
		33.	Innovative technologies developed and used by industries/users	50	d	50	
		34.	Got venture capital funding for innovative ideas/products.	70	d	70	
		35.	Startup Employment (Offering jobs to two persons not less than Rs. 15000/- per month)	70	d	70	
		36.	Societal innovations	40	d	40	

*Level I College Events
*Level II Zonal Events
*Level III State/ University Events
*Level IV National Events
*Level V International Events
**Approval Documents: (a) Certificate (b) Letter from Authorities (c) Appreciation recognition letter (d) Documentary evidence (e) Legal Proof (f) Others (specify)