



Vidyalankar Institute of Technology

An Autonomous Institute affiliated to University of Mumbai

Bachelor of Technology

in

Electronics & Telecommunication Engineering

Programme Structure

(As per AICTE guidelines, with effect from the Academic Year 2022-23)

Preamble

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated, and taken forward in a systematic manner. Therefore, autonomy for Vidyalkar Institute of Technology is not merely a transition from pre-cooked syllabi to self-designed curriculum. Autonomy curriculum of the Institute offers required academic flexibility with emphasis on industry requirements and market trends, employability and problem-solving approach which leads to improving competency level of learners with diverse strengths. In line with this, the curriculum framework designed is **Choice-Based Credit and Grading System (CBCGS)**. Number of credits for each category of courses learnt by learners, internships and projects is finalized considering the scope of study and the ability that a learner should gain through the programme. The overall credits and approach of curriculum proposed is in line with AICTE model curriculum.

The curriculum comprises courses from various categories like basic sciences, humanities and social sciences, engineering sciences, general education and branch specific courses including professional electives and open electives. The curriculum has core courses of branch of engineering positioned and sequenced to achieve sequential and integral learning of the entire breadth of the specific branch. These courses are completed by third year of the engineering programme that enables learners to prepare for higher education during their final year. Professional elective courses, that begins from third year of programme, offer flexibility and diversity to learners to choose specialization from a basket of recent developments in their field of technology. The selection of unique professional elective courses based on industrial requirements and organizing them into tracks is a salient feature of this curricula ensuring employability. Open Elective courses cover multi-disciplinary, special skill development, project management and similar knowledge that make learner capable to work in industrial environment.

For holistic development of learners, apart from technical courses, Humanities and Social Science courses develop the required soft-skills and attitude amongst learners. Our curriculum also introduces Social Service Internship and Internship with institutes abroad along with courses like Design Thinking, Wellness - Body, Mind & Spirit, Indian Traditional Knowledge System under General Education category. These general education courses aim to create balance in brain hemispheres and hence improve learners' clarity in thoughts and responses. In addition to this, the curriculum is augmented with Life Enrichment audit courses for knowledge inspiring experience.

Additionally, curriculum provides add-on minor/honours degree that involves field/ domain study. Learner can avail this degree by completing requirement of additional 15 credits. Thus, the academic plan of VIT envisages a shift from summative to formative and competency-based learning system which will enhance learner's ability towards higher education, employability and entrepreneurship.

Chairman, Board of Studies
Department of Electronics & Telecommunication Engineering
Vidyalkar Institute of Technology

Chairman, Academic Council
Vidyalkar Institute of Technology

COMPETENCE BASED COURSE CATEGORIES AND CREDIT ALLOTMENT

Sr. No.	Competence	Course Category	Credits/Audit
I	Knowledge	Basic Science	18
II		Engineering Science	21
III		Core	48
IV	Skills	Professional Elective	18
V		Open Elective	15
VI		Project and Internship	18
VII	Attitude	Humanities, Social Sciences and Management	12
VIII		General Education	16
IX		Life Enrichment Courses	Audit
Total			166

Learner is expected to complete requirement of 166 credits (with minimum credits under each category as mentioned above) for B.Tech. degree in Electronics & Telecommunication Engineering.

Additionally, learners can choose to avail Honours/ Minor Degree by completing requirements of 15 credits, which will be over and above the 166 credits required for B.Tech. degree.

Structure of Honours/ Minor Degree:

Sr. No.	Category	Credits
1	Course Work	9
2	Industrial Visit	1
3	Problem Definition Articulation	1
4	Proposal Presentation / Synopsis	1
5	Capstone Project	3
Total		15

Definition of Credit:

Duration	Credits
1 Hr. Lecture (L) per week	1
1 Hr. Tutorial (T) per week	1
1 Hr. Practical (P) per week	0.5

Courses Under Various Categories

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
Electronics and Telecommunication Engineering

I. Basic Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	BS16	Engineering Chemistry	2	2	-	3	1
2	BS02	Engineering Mathematics- I	3	-	-	3	1
3	BS15	Engineering Physics	2	2	-	3	2
4	BS04	Engineering Mathematics-II	3	-	-	3	2
5	BS06	Engineering Mathematics-III	3	-	-	3	3
6	BS09	Statistical Signal Analysis/ Mathematical theory of Communication	2	2	-	3	4

II. Engineering Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	ES02	Engineering Mechanics	2	2	-	3	1
2	ES08	Basic Electrical & Electronics Engineering	2	2	-	3	1
3	ES04	Structured Programming	2	2	-	3	1
4	ES05	Object oriented Programming	2	2	-	3	2
5	ES09	Logic Circuit	2	2	-	3	2
6	ES01	Engineering Graphics	2	2	-	3	2
7	ES10	Applications of Physiological principles to Engineering	2	2	-	3	3

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
Electronics and Telecommunication Engineering

III. Core Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	ET01	Electronic Devices and Circuits	3	2	-	3	3
2	ET02	Principles of Communication Engineering	3	2	-	3	3
3	ET03	Signal and Systems	3	2	-	3	3
4	ET04	Network Theory and Transmission lines	3	2	-	3	3
5	ET05	Microprocessor & micro controller	3	2	-	3	4
6	ET06	Integrated Circuits	3	2	-	3	4
7	ET07	Data Structure & Analysis of Algorithm	3	2	-	3	4
8	ET08	Instrumentation and Control Systems	3	2	-	3	4
9	ET09	Digital Communication	3	2	-	3	5
10	ET10	Digital Signal Processing	3	2	-	3	5
11	ET11	EEM- Electromagnetics and Antenna	3	2	-	3	5
12	ET12	RF and Microwave Engineering	3	2	-	3	6
13	ET13	Optical Communication	3	2	-	3	6
14	ET14	Wireless Communication	3	2	-	3	7
15	ET15	Microwave Integrated Circuits	3	2	-	3	7
16	ET16	Network Security	3	2	-	3	8

IV. Professional Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	ET17	Wireless Standards	3	-	1	3	5
2	ET18	Microelectronics	3	-	1	3	5
3	ET19	Machine Learning	3	-	1	3	5
4	ET20	Statistical Analysis	3	-	1	3	5
5	ET21	Operating System	3	-	1	3	5
7	ET34	Data Base Management System	3	2	-	3	5
8	ET33	Image Processing	3	2	-	3	5
9	ET32	Computer Communication networks	3	2	-	3	5
10	ET22	OFDM and MIMO Technology	3	2	-	3	6
11	ET23	Digital VLSI	3	2	-	3	6
12	ET24	Soft Computing	3	2	-	3	6
13	ET25	Data Mining	3	2	-	3	6
14	ET26	Embedded System with Tiny Machine Learning	3	2	-	3	6
15	ET27	Optical and Wireless Networks	3	2	-	3	7
16	ET28	Analog IC Design	3	2	-	3	7
17	ET29	Deep Learning	3	2	-	3	7
18	ET30	Big Data Analytics	3	2	-	3	7
19	ET31	Cloud Computing	3	2	-	3	7

V. Open Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	OE01	Cyber Law	3	-	-	3	7
2	OE02	Project Management	3	-	-	3	7
3	OE03	Product Lifecycle Management	3	-	-	3	7
4	OE04	Sustainability Management	3	-	-	3	7
5	OE05	Operation Research	3	-	-	3	7
6	OE06	IPR and Patenting	3	-	-	3	8

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
Electronics and Telecommunication Engineering

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
7	OE07	Research Methodology	3	-	-	3	8
8	OE08	Renewable Energy Management	3	-	-	3	8
9	OE09	Energy Audit and Management	3	-	-	3	8
10	OE10	E-Farming	3	-	-	3	8
11	OE11	Bioinformatics	3	-	-	3	8
12	OE12	Nanotechnology	3	-	-	3	8

VI. Project and Internship

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	ET36	Mini Project- 1 (Hardware)	-	4	-	2	4
2	ET37	Mini Project- 2 (Software)	-	4	-	2	5
3	ET38	Industry Internship	-	60 (Total)	-	2	TE Break
4	ET39	Project-1 (Synopsis)	3	6	-	6	7
5	ET40	Project-2 (Final)	1	6	-	4	8
6	ET41	Publication	2	-	-	2	8

VII. Humanities, Social Sciences and Management Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	HS01	Effective Communication	2	2	-	3	1
2	HS02	Professional Skills	2	2	-	3	2
3	HS03	Technical and Business Writing	-	4*	-	2	3
4	HS04	Presentation Skills	-	2	-	1	4
5	HS06	Principles of Economics and Management	2	-	1	3	5

*2 hrs. practical class-wise + 2 hrs. of practical batch-wise

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
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VIII. General Education

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	GE01	Design Thinking	2	-	1	3	2
2	GE02	Social Service Internship/ Project	-	6	-	3	3
3	GE03	Internship with other Institutes (Credit Transfer)	2	4	-	4	SE Break
4	GE04	Wellness – Body, Mind & Spirit	1	2	-	2	Any
5	GE05	Basics of Finance & Legal aspects for Business	2	-	-	2	Any
6	GE06	Indian Constitution	2	-	-	2	Any
7	GE07	Universal Human Values	2	-	-	2	Any
8	GE08	Indian Traditional Knowledge System	2	-	-	2	Any
9	GE09	Corporate and social etiquettes	2	-	-	2	Any
10	GE10	Global Citizenship Education	2	-	-	2	Any

IX. List of Life Enrichment courses (Audit only)

Sr. No.	Course Code	Course Title	Hours Per Week (Lecture/Practical/Tutorial)	Credits	Preferred Semester
1	LE01	Photography	2	-	-
2	LE02	Indian Folk Dances	2	-	-
3	LE03	Understanding Indian Classical Music	2	-	-
4	LE04	Wild Life and Conservation	2	-	-
5	LE05	Indian ancient education system	2	-	-
6	LE06	Indian sports	2	-	-
7	LE07	Indian ancient medicinal therapies – Ayurveda	2	-	-
8	LE08	Indian Post -	2	-	-

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
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Sr. No.	Course Code	Course Title	Hours Per Week (Lecture/Practical/Tutorial)	Credits	Preferred Semester
		Connecting people			
9	LE09	Great entrepreneurs	2	-	-
10	LE10	Success stories of Indian space mission	2	-	-
11	LE11	Weather and environment	2	-	-
12	LE12	Unconventional energy	2	-	-

Honours/ Minor Degree courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	ET51	Embedded C (Sem 6)	15 (total)	-	-	1	Break of Sem5 and Sem6
2	ET52	Embedded with Linux	2	2	-	3	6
3	ET67	Multimedia systems	2	2	-	3	6
4	ET53	Advance Machine Learning	15 (total)	-	-	1	Break of Sem6 and Sem7
5	ET54	Game Architecture and Programming	2	2	-	3	7
6	ET55	Adaptive Business Intelligence Systems	2	2	-	3	7
7	ET66	Smart Antennas	2	2	-	3	7
8	ET56	Software defined radio	15 (total)	-	-	1	Break of Sem7 and Sem8
9	ET57	Passive Optical Networks	2	2	-	3	8
10	ET58	Semiconductor memory design & testing	2	2	-	3	8
11	ET59	Device Driver Programming	2	2	-	3	8
12	ET60	Augmented and Virtual Reality	2	2	-	3	8
13	ET61	Data Visualization	2	2	-	3	8
14	ET62	Digital design with	2	2	-	3	8

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
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Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
		FPGA					
15	ET63	Industrial Visit + Problem Definition Articulation +Proposal Presentation / Synopsis	2	2	-	3	8
16	ET64	Project	2	2	-	3	8
17	ET65	MEMS	-	6	-	3	8

Course Structure and Evaluation Scheme
for
Bachelor of Technology
in
Electronics & Telecommunication Engineering

First Year B. Tech. Electronics & Telecommunication Engineering
Course Structure and Evaluation Scheme

Semester: I

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS01	C	Effective Communication	Theory	2	15	20	40	075
		T	Effective Communication	Practical	1	25	-	25	050
2	BS16	C	Engineering Chemistry	Theory	2	15	20	40	075
		T	Engineering Chemistry	Practical	1	25	-	25	050
3	BS02	C	Applied Mathematics-I	Theory	3	20	30	50	100
4	ES02	C	Engineering Mechanics	Theory	2	15	20	40	075
		T	Engineering Mechanics	Practical	1	25	-	25	050
5	ES08	C	Basic Electrical & Electronics Engineering	Theory	2	15	20	40	075
		T	Basic Electrical & Electronics Engineering	Practical	1	25	-	25	050
6	ES04	C	Structured Programming	Theory	2	15	20	40	075
		T	Structured Programming	Practical	1	25	-	25	050
7	GEXX	E	Any GE course from GE04 onwards	As per course	2	25	-	50	075
Total Credits					20	-	-	-	-

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
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First Year B. Tech. Electronics & Telecommunication Engineering

Semester: II

Course Structure and Evaluation Scheme

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS02	C	Professional Skills	Theory	2	15	20	40	075
		T	Professional Skills	Practical	1	25	-	25	050
2	BS15	C	Engineering Physics	Theory	2	15	20	40	075
		T	Engineering Physics	Practical	1	25	-	25	050
3	BS04	C	Engineering Mathematics-II	Theory	3	20	30	50	100
4	ES01	C	Engineering Graphics	Theory	2	15	20	40	075
		T	Engineering Graphics	Practical	1	25	-	25	050
5	ES09	C	Logic Circuits	Theory	2	15	20	40	075
		T	Logic Circuits	Practical	1	25	-	25	050
6	ES05	C	Object-Oriented Programming	Theory	2	15	20	40	075
		T	Object-Oriented Programming	Practical	1	25	-	25	050
7	GE01	C	Design Thinking	Theory	2	15	20	40	075
		T	Design Thinking	Tutorial	1	50	-	-	050
8	GEXX	E	Any GE course from GE04 onwards	As per course	2	25	-	50	075
Total credits					23	-	-	-	-

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
C=Compulsory, T=Tandem, E=Elective, A=Audit

Second Year B. Tech. Electronics & Telecommunication Engineering

Semester: III

Course Structure and Evaluation Scheme

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS03	C	Technical and Business Writing	Practical	2	50	-	-	050
2	BS06	C	Applied Mathematics-III	Theory	3	20	30	50	100
3	ES10	C	Applications of Physiological principles to Engineering	Theory	2	15	20	40	075
		T	Applications of Physiological principles to Engineering	Practical	1	25	-	25	050
4	ET01	C	Electronic Devices and Circuits	Theory	2	15	20	40	075
		T	Electronic Devices and Circuits	Practical	1	25	-	25	050
5	ET02	C	Principles of Communication Engineering	Theory	2	15	20	40	075
		T	Principles of Communication Engineering	Practical	1	25	-	25	050
6	ET03	C	Signal and Systems	Theory	2	15	20	40	075
		T	Signal and Systems	Practical	1	25	-	25	050
7	ET04	C	Network Theory and Transmission lines	Theory	2	15	20	40	075
		T	Network Theory and Transmission lines	Practical	1	25	-	25	050
8	GE02	C	Social Service Internship/ Project	Practical	3#	75	-	-	075
Total Credits					23	-	-	-	-

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#For Social Service Internship/ Project, 2 hours/ week slot will be provided during the semester (in regular timetable). Work of 60 hours needs to be completed during the semester (besides regular timetable) or after the semester (during inter semester break).

Second Year B. Tech. Electronics & Telecommunication Engineering

Semester: IV

Course Structure and Evaluation Scheme

Course				Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
Code	Nature	Name	ISA			MSE	ESE		
1	HS04	T	Presentation Skills	Theory	1	25	-	25	050
2	BS09	C	Statistical Signal Analysis/ Mathematical theory of Communication	Theory	3	20	30	50	100
3	ET05	C	Microprocessor & micro controller	Theory	2	15	20	40	075
		T	Microprocessor & micro controller	Practical	1	25	-	25	050
4	ET06	C	Integrated Circuits	Theory	2	15	20	40	075
		T	Integrated Circuits	Practical	1	25	-	25	050
5	ET07	C	Data Structure & Analysis of Algorithm	Theory	2	15	20	40	075
		T	Data Structure & Analysis of Algorithm	Practical	1	25	-	25	050
6	ET08	C	Instrumentation and Control Systems	Theory	2	15	20	40	075
		T	Instrumentation and Control Systems	Practical	1	25	-	25	050
7	ET36	C	Mini Project 1 (Hardware)	Practical	2	25	-	25	050
8	GEXX	E	Any GE course from GE04 onwards	As per course	2	25	-	50	075
Total Credits					20	-	-	-	-

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Second Year B.Tech. Electronics & Telecommunication Engineering - Summer Break

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)		Total marks (Passing@40% of total marks)
	Code	Nature	Name			Internal	External	
1	GE03	C	Internship with other Institutes (Credit Transfer)	Theory	2	25	25	050
		T	Internship with other Institutes (Credit Transfer)	Practical	2	25	25	050
Total Credits					4	-	-	-

Third Year B. Tech. Electronics & Telecommunication Engineering

Semester: V

Course Structure and Evaluation Scheme

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS06	C	Principles of Economics & Management	Theory	2	15	20	40	075
		T		Tutorial	1	50	-	-	050
2	ET09	C	Digital Communication	Theory	2	15	20	40	075
		T	Digital Communication	Practical	1	25	-	25	050
3	ET10	C	Digital Signal Processing	Theory	2	15	20	40	075
		T	Digital Signal Processing	Practical	1	25	-	25	050
4	ET11	C	EEM- Electromagnetics and Antenna	Theory	2	15	20	40	075
		T	EEM- Electromagnetics and Antenna	Practical	1	25	-	25	050
5	OEXX	E	Any one from the offered Open Elective courses	Theory	2	15	20	40	075
		T		Practical	1	25	-	25	050
6	ETXX	E	Professional Elective-1	Theory	2	15	20	40	075
		T	Professional Elective-1	Practical	1	25	-	25	050
7	ETXX	E	Professional Elective-2	Theory	2	15	20	40	075
		T	Professional Elective-2	Practical	1	25	-	25	050
8	ET37	C	Mini-Project 2	Practical	2	25	-	50	075
Total Credits					23	-	-	-	-

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Guidelines for Professional Elective Courses and Specialization Certificate – Refer Appendix-A

Important Note 1: Learners are required to go through the Appendix-A carefully before selecting the professional elective courses. Detailed guidelines regarding professional elective courses, specialization tracks and courses relevant to each track are given in Appendix-A. We have group A and group B for professional electives. Group A consists of tracks- Communication and VLSI, while Group B consists of

tracks- Embedded System and IoT, AI/ML and Data Analytics. The learners can choose one track from each group.

Professional Elective-1 & 2 courses (ETPXX)

Course Code	Group	Course Name	Specialization Track Name #
ET17	A	Wireless Standards	Communication
ET32	A	Computer Communication Networks	Communication
ET18	A	Microelectronics	VLSI
ET33	A	Image Processing	VLSI
ET21	B	Operating System	Embedded Systems & IoT
ET19	B	Machine Learning	AI/ML
ET20	B	Statistical Analysis	Data Analytics
ET34	B	Data Base Management System	Data Analytics

For details of Specialization Certificate, refer Appendix - A

Guidelines for Award of Honours/ Minor Degree – Refer Appendix-B

Important Note 2: Before the end of Semester 5, learners are required to go through the Appendix-B carefully to opt for Honours/ Minor Degree Programme. The Honours/ Minor degree programme will span from the end of semester 5 to the end of Semester 8. Detailed guidelines regarding the Honours/ Minor degree programmes of all the departments, Eligibility criterion and Credit requirements are given in Appendix-B. Courses relevant to Honours/ Minor Degree Programmes offered by Department of Electronics & Telecommunication Engineering are given in Appendix-C.

Third Year B. Tech. Electronics & Telecommunication Engineering

Semester: VI

Course Structure and Evaluation Scheme

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	ET12	C	RF and Microwave Engineering	Theory	2	15	20	40	075
		T	RF and Microwave Engineering	Practical	1	25	-	25	050
2	ET13	C	Optical Communication	Theory	2	15	20	40	075
		T	Optical Communication	Practical	1	25	-	25	050
3	OEXX	E	Any two from the offered Open Elective courses	Theory	2	15	20	40	075
		T		Practical	1	25	-	25	050
4	OEXX	E		Theory	2	15	20	40	075
		T		Practical	1	25	-	25	050
5	ETXX	E	Professional Elective-3	Theory	2	15	20	40	075
		T	Professional Elective-3	Practical	1	25	-	25	050
6	ETXX	E	Professional Elective-4	Theory	2	15	20	40	075
		T	Professional Elective-4	Practical	1	25	-	25	050
Total					18	-	-	-	-

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List of Professional Elective 3 & 4 Courses (ETPXX)

Course Code	Group	Course Name	Specialization Track Name #
ET22	A	OFDM and MIMO Technology	Communication
ET23	A	Digital VLSI	VLSI
ET26	B	Embedded System with Tiny ML	Embedded Systems & IoT
ET24	B	Soft Computing	AI/ML
ET25	B	Data Mining	Data Analytics

#For details of Specialization Certificate, refer Appendix-A

Programme Structure (2022) for Bachelor of Technology (B.Tech)-
Electronics and Telecommunication Engineering

Third Year B. Tech. Electronics & Telecommunication Engineering - Summer Break

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)		Total marks (Passing@40% of total marks)
	Code	Nature	Course Name			Internal	External	
1	ET38	C	Industry Internship	Practical	2	25	25	50
Total Credits					2	-	-	-

Final Year B. Tech. Electronics & Telecommunication Engineering

Semester: VII

Course Structure and Evaluation Scheme

Sr. No.	Course			Head of teaching	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	ET14	C	Wireless Communication	Theory	2	15	20	40	075
		T	Wireless Communication	Practical	1	25	-	25	050
2	ET15	C	Microwave Integrated Circuits	Theory	2	15	20	40	075
		T	Microwave Integrated Circuits	Practical	1	25	-	25	050
3	ETXX	E	Professional Elective-5	Theory	2	15	20	40	075
		T	Professional Elective-5	Practical	1	25	-	25	050
4	ETXX	E	Professional Elective-6	Theory	2	15	20	40	075
		T	Professional Elective-6	Practical	1	25	-	25	050
5	OEXX	E	Any one from the offered Open Elective courses	Theory	2	15	20	40	075
		T		Practical	1	25	-	25	050
6	ET39	C	Project 1 (Synopsis)	Theory	6	100	-	100	200
Total Credits					21	-	-	-	-

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
C=Compulsory, T=Tandem, E=Elective, A=Audit

List of Professional Elective 5 & 6 Courses (ETPXX)

Course Code	Group	Course Name	Specialization Track Name
ET27	A	Optical and Wireless Networks	Communication
ET28	A	Analog IC Design	VLSI
ET31	B	Cloud Computing	Embedded Systems & IoT
ET29	B	Deep Learning	AI/ML
ET30	B	Big Data Analytics	Data Analytics

#For details of Specialization Certificate, refer Appendix-A

Course Structure and Evaluation Scheme

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	OEXX	E	Any one from the offered Open Elective courses	Theory	2	15	20	40	075
		T		Practical	1	25	-	25	050
2	ET16	C	Network Security	Theory	1	25	-	-	025
		T	Network Security	Practical	3	25	-	50	075
3	ET40	C	Project 2- (Final)	Theory	1	25	-	-	025
		T	Project 2- (Final)	Practical	3	50	-	50	100
4	ET41	C	Publication	Theory	1	25	-	50	075
Total Credits					12	-	-	-	-

#For details of Specialization Certificate, refer Appendix-A

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
C=Compulsory, T=Tandem, E=Elective, A=Audit

Appendix-A

Guidelines for Professional Elective Courses and Specialization Certificate

Professional Elective courses are designed to meet industrial requirements. All learners must opt for 6 professional elective courses (2 courses in Semester 5, 2 courses in Semester 6 and 2 courses in Semester 7) as a part of requirement for B.Tech. degree.

Specialization Certificate is introduced in order to build competency of learners in the chosen domain. Department of Electronics & Telecommunication Engineering offer the following specialization tracks:

Group	Specialization Track Name
A	Communication
A	VLSI
B	Embedded Systems & IoT
B	AI/ML
B	Data Analytics

We have group A and group B for professional electives. Group A consists of tracks- Communication and VLSI, while Group B consists of tracks- Embedded System and IoT, AI/ML and Data Analytics. The learners can choose one track from each group.

From semester 5 to semester 7, learners can take courses from any track. **However, if learners complete all Professional Elective courses from the same chosen track from semester 5 to semester 7, they will be eligible to receive a Specialization Certificate from the Institute.**

Learners who choose professional elective courses from different specialisation tracks from semester 5 to semester 7 will not be eligible for a Specialization Certificate.

It should be noted that there are no additional credit requirements for these specialisations.

Communication: Courses to be chosen for specialization in Communication Track

Semester	Course Code	Course Name
V	ET17	Wireless Standards
V	ET32	Computer Communication Networks
VI	ET22	OFDM and MIMO Technology
VII	ET27	Optical and Wireless Networks

VLSI: Courses to be chosen for specialization in VLSI Track

Semester	Course Code	Course Name
V	ET18	Microelectronics
VI	ET23	Digital VLSI
VII	ET28	Analog IC Design

Embedded systems and IoT: Courses to be chosen for specialization in Embedded systems and IoT Track

Semester	Course Code	Course Name
V	ET21	Operating System
V	ET33	Image Processing
VI	ET26	Embedded System with Tiny ML
VII	ET31	Cloud Computing

AI/ML: Courses to be chosen for specialization in AI/ML Track

Semester	Course Code	Course Name
V	ET19	Machine Learning
VI	ET24	Soft Computing
VII	ET29	Deep Learning

Data Analytics: Courses to be chosen for specialization in Data Analytics Track

Semester	Course Code	Course Name
V	ET20	Statistical Analysis
V	ET34	Data Base Management System
VI	ET25	Data Mining
VII	ET30	Big Data Analytics

Appendix-B

Guidelines for Award of Honours/ Minor Degree Programme

Honours and Minor Degree programme is introduced in order to facilitate learners to enhance the depth of knowledge, diversity, breadth and skills in emerging fields. An Honours or Minor degree typically refers to a higher level of academic achievement either for research orientation or for improving employability. Learners can select any Honours or Minor degree programme as per his/her choice.

In our curriculum, learners can choose to avail Honours/Minor Degree programme by completing requirements of 15 credits, which will be over and above the credits required for B.Tech. degree. Learner shall opt for Honours or Minor specialisations during the break of Semester 5 and Semester 6. **Learner may complete the B.Tech. degree programme without opting for honours or minor degree programme** i.e. Opting for Honours/Minor Degree programme is not mandatory as a part of B.Tech. Degree programme.

For Honours degree, learner shall select Honour programme offered by his/her own department. Alternatively, for Minor degree, learner shall select Honour programme offered by any other department.

Eligibility Criteria

- Learner should have no backlog in Semester 1, 2, 3 and 4.
- The CGPI (based on Semester 1, 2, 3 and 4) of the learner must be 6.75 and above.
- Learner can opt for only one Honours/ Minor degree programme.
- Learners cannot opt for those Honours/ Minor degree programmes which include courses that he/she has chosen under Professional Elective Courses and /or under any other Category of courses.
- Honours/ Minor degree programme can only be opted by a learner during their regular engineering studies.
- Learner must complete the Honours/ Minor degree programme in the stipulated time of 3 semesters only i.e. from end of Semester 5 to end of Semester 8.

Syllabus Scheme Template

Sr. No.	Course			Head of Learning	Sem	Credits	Evaluation scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name				ISA	MSE	ESE	
1	XXXX	C	Industry Interaction	Theory	Break of Sem5 and Sem6	1	25	-	-	025
2	XXXX	E	Honours / Minor	Theory	6	2	15	20	40	075

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			Degree Course 1							
		T	Honours / Minor Degree Course 1	Practical	6	1	25	-	25	050
3	XXXX	C	Survey Report/ Paper	Theory	Break of Sem6 and Sem7	1	25	-	-	025
4	XXXX	E	Honours / Minor Degree Course 2	Theory	7	2	15	20	40	075
		T	Honours / Minor Degree Course 2	Practical	7	1	25	-	25	050
5	XXXX	C	Seminar	Theory	Break of Sem7 and Sem8	1	25	-	-	025
6	XXXX	E	Honours / Minor Degree Course 3	Theory	8	2	15	20	40	075
		T	Honours / Minor Degree Course 3	Practical	8	1	25	-	25	050
7	XXXX	C	Capstone Project	Practical	8	3	50	-	50	100
Total Credits						15	-	-	-	-

Honours/ Minor Degree Programmes offered by all departments

Sr.No.	Honours/ Minor Degree Programme	Department offering Honours	Department offering Minor
1	Data Analytics	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
2	Social Media Insights	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical

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3	Advanced IoT	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
4	Advanced Cyber Security	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
5	Intelligent Game Development	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
6	Data Science and Machine Learning	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
7	Artificial Intelligence and Data Analysis	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
8	Data Science and Forecasting	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
9	Smart City Management	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
10	Cyber Forensic and Penetration	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
11	Crypto Currency	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
12	Intelligent Game Development	<ul style="list-style-type: none"> Electronics and Computer Science 	<ul style="list-style-type: none"> Information Technology Computer Engineering Electronics and Telecommunication Biomedical
13	Data Engineering	<ul style="list-style-type: none"> Electronics and Computer Science 	<ul style="list-style-type: none"> Information Technology Computer Engineering Electronics and Telecommunication Biomedical
14	Smart City-Design and Development	<ul style="list-style-type: none"> Electronics and Computer Science 	<ul style="list-style-type: none"> Information Technology Computer Engineering Electronics and Telecommunication Biomedical
15	Electronic Product Development	<ul style="list-style-type: none"> Electronics and Computer Science 	<ul style="list-style-type: none"> Information Technology Computer Engineering

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			<ul style="list-style-type: none"> • Electronics and Telecommunication • Biomedical
16	Advanced Embedded System	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
17	Intelligent Game Development	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
18	Sentiment Analytics and Data Forecasting	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
19	Advanced Communication Technology	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
20	Advanced VLSI Technology	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
21	AI in Healthcare	<ul style="list-style-type: none"> • Biomedical 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Electronics and Telecommunication
22	Medical IOT	<ul style="list-style-type: none"> • Biomedical 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Electronics and Telecommunication
23	Medical Imaging Technology	<ul style="list-style-type: none"> • Biomedical 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Electronics and Telecommunication

Detailed list of courses under each Honours/ Minor Degree Programme:

- Electronics & Telecommunication Department learners can refer to the list of Honours Degree Programme and their corresponding courses in the Appendix-C.
- Learners of Electronics & Telecommunication Department who wish to opt for Minor Degree Programme offered by other department can obtain details of these programmes from Appendix-C of the respective department.

Appendix-C

Honours/ Minor Degree Programmes offered by Department of Electronics & Telecommunication Engineering

Department of Electronics & Telecommunication Engineering offers the below listed Honours degree programme for learners of Electronics & Telecommunication Engineering. These programmes can be availed as Minor degree programme by learners of other departments of the Institute.

1. Advanced Embedded Systems
2. Intelligent Game Development
3. Sentiment Analysis & Data Forecasting
4. Advanced Communication Technology
5. Advanced VLSI Technology

Courses to be successfully completed as a part of Honours/ Minor Degree Programme

1. Advanced Embedded Systems

Semester	Course Code	Course Name
VI	ET51	Embedded C
VII	ET52	Embedded with Linux
VII	ET59	Device Driver Programming

2. Intelligent Game Development

Semester	Course Code	Course Name
VI	ET67	Multimedia System
VII	ET54	Game Architecture and Programming
VII	ET60	Augmented and Virtual Reality

3. Sentiment Analysis & Data Forecasting

Semester	Course Code	Course Name
VI	ET53	Advance Machine Learning
VII	ET55	Adaptive Business Intelligence Systems
VII	ET61	Data Visualization

4. Advanced Communication Technology

Semester	Course Code	Course Name
VI	ET56	Software defined radio
VII	ET57	Passive Optical Networks
VII	ET66	Smart Antennas

5. Advanced VLSI Technology

Semester	Course Code	Course Name
VI	ET65	MEMS

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VII	ET58	Semiconductor memory design & testing
VII	ET62	Digital design with FPGA

(Draft copy of Programme Scheme (R-2022), Subject to approval of Academic Council, Vidyalankar Institute of Technology)