



ARISE & SHINE

**ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY,
ACCREDITED BY NAAC WITH 'A' Grade**

PROGRAMME SCHEME & SYLLABI 2021 – 2022

B. Tech. (Electronics and Telecommunication)

- **About the department**

Electronics and Telecommunication Engineering, the combination of two major branches of engineering, is one of the largest and fastest growing sectors in the industry. This branch, distinguishes itself from other technical trades, constantly re-defining its sphere of influence.

It does help us to see, hear and communicate over vast distances, supervise production and manufacturing processes, overseeing installation and maintenance of computers, peripherals and components. We work with equipment that use extremely small amounts of power. The role of the Electronics Engineer is pivotal, in realms ranging from the toy industry, to consumer electronics, from household articles to space or satellite communication.

This department has been established in the year 2004 in the year with a single intake of 60 students and it has been increased to 120 students in the year 2012.

Vision

To develop disciplined & ethically strong Electronics & Telecommunication engineers having multidisciplinary knowledge with entrepreneurship & leadership skills to serve the society.

Mission

To hone young minds with knowledge in the field of Electronics and Telecommunication Engineering & related areas with a focus,

- To develop professional competencies through proactive industry collaborations.
- To encourage students for higher studies & research activities.
- To inculcate a spirit of service & a concern for the environment.

Program education objectives

- To produce graduates with sound theoretical & practical knowledge by applying basic principles of mathematics, sciences & engineering with modern tools and techniques.
- To produce technically competent graduates with ability to analyze, design, develop, test, optimize and integrate systems through experimentation for real life problems.
- To inculcate in graduates the professional & ethical attitude, leadership skill, multidisciplinary approach & ability to apply engineering concepts in the social and environmental context.
- To motivate & prepare graduates to pursue higher education and research & continuous professional development.

Program outcomes

- 1) Engineering Knowledge:- Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
- 2) Problem Analysis:- Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3) Design/development of solutions:- Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental Considerations.
- 4) Conduct investigations of complex Problems:- Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5) Modern tool usage:- Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6) The engineer and society:- Apply reasoning informed by the conceptual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7) Environment and sustainability:- Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
- 8) Ethics:- Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9) Individual and team work:- Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10) Communication:- Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11) Project management and finance:- Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12) Life-long learning:- Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program specific outcomes

1. PSO1:- Apply the core knowledge for the analysis and design of components in Communication, Signal Processing, VLSI, Embedded Systems, Information Technology and Automation
2. PSO2:-Adopt innovation, creativity and design to develop products which meet the industrial and societal needs.

**ST. VINCENT PALLOTTI COLLEGE OF
ENGINEERING & TECHNOLOGY, NAGPUR**

TEACHING SCHEME

**FOUR YEAR BACHELOR OF TECHNOLOGY (B. TECH.)
DEGREE COURSE**

**BRANCH : ELECTRONICS AND TELECOMMUNICATION
ENGINEERING**

• **Credit Structure for Undergraduate programs** •

Sr. No	Category	Credits	AICTE Norms
1	Humanities, Social Sciences & Management courses	15	15
2	Basic Science courses	24	25
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	18	24
4	Professional core courses	58	48
5	Professional Elective courses relevant to chosen specialization/branch	21	18
6	Open subjects – Electives from other technical and /or emerging subjects	18	18
7	Project work, seminar and internship in industry or elsewhere	13	15
8	Mandatory Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Knowledge Tradition]	0	0
9	Comprehensive Courses [Industry Training and Skill Development, Capstone Course]	4	0
	TOTAL	170	

**** BoS specific**

Option A – Credits of (Project – I + Project –II + One Semester Internship based project)

Option B – Credits of (Project – I + Project –II + 6 (Project – III))

ANNEXURE – I

Scheme of Examination of Bachelor of Technology

Semester Pattern

III Semester B. Tech (Electronics and Telecommunication Engineering)

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS301T	Applied Mathematics – III	3	1	-	4	30	70	100
2	ET302T	Object Oriented Programming	3	1		4	30	70	100
3	ET302P	Object Oriented Programming			2	1	25	25	50
4	ET303T	Electronic Devices and Circuits	4			4	30	70	100
5	ET303P	Electronic Devices and Circuits			2	1	25	25	50
6	EE301T	Network Theory	3	1		4	30	70	100
7	ET304P	Circuit simulation and coding Lab			2	1	25	25	50
8	AS302T	Constitution of India	2			0	15	35	50
10	ET305T	Sports, Yoga, & Career Development *			2	0			
Total			15	3	8	19	210	390	600

* Career Development (Interpersonal Skills, Aptitude, and Logical Thinking)

Scheme of Examination of Bachelor of Technology

Semester Pattern

IV Semester B. Tech. (Electronics and Telecommunication Engineering)

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	ET401T	Electromagnetic Fields	3	1		4	30	70	100
2	ET402T	Electronic Measurement and Instrumentation	3			3	30	70	100
3	ET402P	Electronic Measurement and Instrumentation			2	1	25	25	50
4	ET403T	Digital Electronics	3	1		4	30	70	100
5	ET403P	Digital Electronics			2	1	25	25	50
6	ET404T	Signals and Systems Analysis	3			3	30	70	100
7	ET405P	Microcontrollers and coding Lab			2	1	25	25	50
8	ET406P	Tinkering Lab			2	1	25	25	50
9	H 102	Universal Human Values - 2	3			3	30	70	100
10	ET407P	Technical Skill Development**			2	1		50	50
11	ET408T	Career Development *	2			0			
Total			17	2	10	22	250	500	750

* Career Development (Interpersonal Skills, Aptitude, and Logical Thinking)

** Technical Skill Development – Desirable to have Industry skill enhancement

Scheme of Examination of Bachelor of Technology

Semester Pattern

V Semester B. Tech. (Electronics and Telecommunication Engineering)

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	ET501T	Microprocessor and Microcontroller	2	1		3	30	70	100
2	ET501P	Microprocessor and Microcontroller			2	1	25	25	50
3	ET502T	Analog Circuit design	2	1		3	30	70	100
4	ET502P	Analog Circuit design			2	1	25	25	50
5	ET503T	Analog and Digital Communication	2			2	15	35	50
6	ET503P	Analog and Digital Communication			2	1	25	25	50
5	H103/4T	Foundational Humanities Elective	2			0			
6	ET504T	Elective - I	3			3	15	35	50
7	ET505T	Open Elective I	3			3	30	70	100
8	ET505P	Open Elective I			2	1	25	25	50
9	AS501T	Economics and Management	4			4	30	70	100
10	AS502T	English for Engineers	2			2	15	35	50
11	ET506P	Technical Skill Development**			2	1		50	50
12	ET507P	Career Development *			4	0			
Total			20	2	14	25	265	535	800

* Career Development(Interpersonal Skills, Aptitude, and Logical Thinking)

** Technical Skill Development – Desirable to have Industry skill enhancement

ET504T	Elective - I
ET504T(i)	Antenna and Wave Propagation
EE504T(ii)	Control Systems
ET504T(iii)	Internet of Things

ET505T	Open Elective - I
ET505T(i)	Wireless Communication Modules and Interfacing
ET505T(ii)	Industrial Applications of Microcontroller

ET505P	Open Elective - I
ET505P(i)	Wireless Communication Modules and Interfacing
ET505P(ii)	Industrial Applications of Microcontroller

	Foundational Humanities Elective
H-103	Development of Societies
H 104	Philosophy

Scheme of Examination of Bachelor of Technology

Semester Pattern

VI Semester B. Tech. (Electronics and Telecommunication Engineering)

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	ET601T	Digital Signal Processing	2			2	15	35	50
2	ET601P	Digital Signal Processing			2	1	25	25	50
3	ET602T	Digital Systems Design	2	1		3	30	70	100
4	ET602P	Digital Systems Design			2	1	25	25	50
5	ET603T	Elective - II	3			3	30	70	100
6	ET604T	Elective - III	4			4	30	70	100
7	ET605T	Open Elective-II	3	1		4	30	70	100
8	ET606P	Project - I			4	2	50	50	100
9	ID601P	Career Development*			4	0			
10	ET606P	Capstone Course – I **			2	1	25	25	50
Total			14	2	14	21	260	440	700

* Career Development (Interpersonal Skills and Aptitude)

** Capstone Course – I (Comprehensive knowledge gained in Electronics and Tel. Engineering)

ET603T	Elective - II
ET603T(i)	Communication Switching networks
ET603T(ii)	Computer Communication Network
ET603T(iii)	Optical Communication
ET603T(iv)	Wireless Communication
ET603(V)	Satellite Communication

ET604T	Elective - III
ET604T(i)	Biomedical Instrumentation Engineering
EE604T(ii)	Power Devices and Machines(PDM)
ET604T(iii)	Probability Theory & Stochastic Processes

ET605T	Open Elective-II
ET605T(i)	Internet of things with Arduino and Raspberry pi
ET605T(ii)	Introduction to information theory and coding

Scheme of Examination of Bachelor of Technology

Semester Pattern

VII Semester B. Tech.(Electronics and Telecommunication Engineering)

Sr No	Course Code	Course Title	Hours per Week			Credi ts	Maximum Marks		Total	ESE Duration (hrs)
			L	T	P		Continual Assessment	End Sem Examinati on		
1	ET701T	Wireless communication and Microwave Engineering	3			3	30	70	100	3
2	ET701P	Wireless communication and Microwave Engineering			2	1	25	25	50	
3	ET702T	Architectures of Digital Signal Processors	2			2	15	35	50	2
4	ET702P	Architectures of Digital Signal Processors			2	1	25	25	50	
5	ET703T	Elective - IV	3			3	30	70	100	3
6	ET703P	Elective - IV Lab			2	1	25	25	50	
7	ET704T	Elective - V	3			3	30	70	100	3
	ET801T	Elective - VI	3			3	15	35	50	2
8	ET705T	Open Elective - III	4			4	30	70	100	3
9	ET706P	Project - II			8	4	75	75	150	
		Summer / Winter Internship *								
10	ET707P	Capstone Course – II **			2	1	25	25	50	
Total			18		16	26	325	525	850	16

* Summer / Winter Internship (Evaluation of Four weeks Internship Completion till 6th Semester)

** Capstone Course – II (Comprehensive knowledge gained in *branch name*)

ET703T	Elective - IV
ET703T(i)	Embedded Systems
ET703T(ii)	CMOS Analog and Digital VLSI Design
ET703T(iii)	Digital Image Processing
ET703T(iv)	Cellular Communication

ET703P	Elective - IV Lab
ET703P(i)	Embedded Systems
ET703P(ii)	CMOS Analog and Digital VLSI Design
ET703P(iii)	Digital Image and Video Processing
ET703P(iv)	Cellular Communication

ET704T	Elective - V
ET704T(i)	Vlsi Signal Processing (VSP)
ET704T(ii)	Testing and Verification in VLSI circuits
ET704T(iii)	Bio Signal Processing
ET704T(iv)	CPLD And FPGA Architecture

ET801T	Elective - VI
ET801T	Elective - VI (SWAYAM/NPTEL based)- Certificate Course on advanced Technology

**** Comprehensive Online Exam**

Scheme of Examination of Bachelor of Technology

Semester Pattern

VIII Semester B. Tech. (Electronics and Telecommunication Engineering)

Option A

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1		Project based on one semester internship in Industry/Research Institute/National Laboratories/Incubation Center				12			
Total			0	0	0	12	200	200	400

*End Semester Examination will consist of evaluation of seminar and project report

Option B

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	ET801T	Open Elective -IV	3			3	30	70	100
2	ET802T	Open Elective – V	3			3	30	70	100
3	ET803P	Project based on Research/ Industry/ Entrepreneurship			12	6	100	100	200
Total			6	0	12	12	160	240	400

*Open electives can be MOOCs or Courses offered by department in Online/Offline mode

	Open Elective IV
ET801T	Applications of AI in Robotics

	Open Elective - V
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ET802T	Mobile phone hardware design
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ET505T	Open Elective - I
ET505T(i)	Wireless Communication Modules and Interfacing
ET505T(ii)	Industrial Applications of Microcontroller

ET605T	Open Elective-II
ET605T(i)	Internet of Things
ET605T(ii)	Introduction to information theory and coding

ET705T	Open Elective - III
ET705T(i)	Medical Image Processing and Analysis
ET705T(ii)	Design of Solar Photovoltaic Systems

ET801T	Open Elective - IV
ET801T	Applications of AI in Robotics

ET802T	Open Elective - V
ET802T	Mobile phone hardware design

Scheme of Examination of Bachelor of Technology (Electronics and Telecommunication Engineering)-Minors

Minors Scheme - Embedded Systems

Sr No	Course Code	Semester	Name of Course	Hours per Week			Credits	Maximum Marks			ESE Duration (hrs)
				L	T	P		Continual Assessment	End Sem Examination	Total	
1	ETM401T	IV	Fundamentals of Digital Electronics	4			4	30	70	100	3
2	ETM501T	V	Microprocessors and Interfacing	3			3	30	70	100	3
3	ETM501P	V	Microprocessors and Interfacing			2	1	25	25	50	
4	ETM601T	VI	Microcontrollers and Embedded C	3			3	30	70	100	3
5	ETM601P	VI	Microcontrollers and Embedded C			2	1	25	25	50	
6	ETM701T	VII	Sensors and Actuators	3			3	30	70	100	3
7	ETM701P	VII	Sensors and Actuators			2	1	25	25	50	
8	ETM801T	VIII	Embedded systems and Applications	4			4	30	70	100	3
Total				17		6	20	225	425	650	15

Scheme of Examination of Bachelor of Technology (Electronics and Telecommunication Engineering)-Honors

Honors Specialization - Internet of Things

Sr No	Course Code	Semester	Name of Course	Hours per Week			Credits	Maximum Marks			ESE Duration (hrs)
				L	T	P		Continual Assessment	End Sem Examination	Total	
1	ETH401T	IV	Fundamentals of IoT(Th)	4			4	30	70	100	3
2	ETH501T	V	IOT:Sensors and devices(Th)	3			3	30	70	100	3
3	ETH501P	V	IOT: Sensors and devices(Pr)			2	1	25	25	50	
4	ETH601T	VI	Cloud platform for IOT(Th)	4			4	30	70	100	3
5	ETH701T	VII	IOT Communication (Th)	3			3	30	70	100	3
6	ETH701P	VII	IOT Communication (Pr)			2	1	25	25	50	
7	ETH801P	VIII	Project			4	4	50	50	100	
Total				14		8	20	220	380	600	12