Thadomal Shahani Engineering College

(A Constituent College of HSNC University, Mumbai)

Bachelor of Engineering (B.E.)

in

Electronics & Telecommunication

Programme Scheme

R-2026

(As per NEP 2020)

Undergraduate Programme

Applicable from Academic Year 2027–28

(Subject to revision after every two academic years)

Thadomal Shahani Engineering College

(A Constituent College of HSNC University, Mumbai)

Institute Vision:

Perpetuating and transcending the processes of:

- Contributing to evolving supply chain of human capital for National Economy
- Creating entrepreneurs and 'game changers' to support heightened level of economic activities underpinning ever increasing human aspiration
- Helping the Nation evolve as a total solution provider
- Value and wealth creation for the mankind

Institute Mission:

Focusing and practicing:

- Product and processes innovation
- Leveraging human cognitive and behavioral science for creating instructional content
- Pervasive and ubiquitous Information Communication Technologies for customized content for learning
- Acknowledge and facilitate various learning styles and learning abilities
- Migrating from teaching paradigm to learning paradigm
- Every day discourse shall inculcate research culture and further the cause of societal advancement
- Understand various markets and cultures
- Collaborative learning and emotional integrity
- Sensitizing about opportunities in Energy, Education, Environment and Health care sectors
- Extensively promoting computer aided design, analysis and manufacturing procedures
- Theoretical rigor to develop conceptual clarity
- Modeling and design of experiments to inculcate culture of investigation
- Helping foot print on Project management and collaborative human endeavor
- Interdisciplinary studies and exposure to functional areas

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Department Vision:

The Department of Electronics and Telecommunication Engineering at Thadomal Shahani Engineering College aspires to be a technical education and research leader, shaping students into innovative, competent and ethical engineers, ready to contribute to technological advancements and societal needs.

Department Mission:

1. Educational Excellence: Foster an environment that combines rigorous academic standards with practical, hands-on learning to prepare students for the challenges in Electronics and Telecommunication Engineering.

2. Research and Innovation: Encourage a culture of research and innovation, facilitating collaborations with industry and academia to keep pace with technological advancements.

3. Ethical Engineering: Commit to ethical engineering practices and sustainability, emphasizing the importance of social responsibility in all engineering solutions.

4. Professional Development: Provide students with opportunities for professional growth through internships, workshops and interaction with industry leaders to ensure they are industry-ready upon graduation.

5. Lifelong Learning: Promote lifelong learning and continuous professional development, enabling graduates to adapt to rapidly changing technologies and global challenges.

Program Specific Outcomes (PSOs)

- PSO1: Engineering Solutions: Graduates will be proficient in designing, analyzing and implementing Telecommunication and Electronic systems that meet desired specifications and are relevant to industry and societal needs.

- PSO2: Modern Tools Utilization: Graduates will demonstrate an ability to select and apply modern engineering tools and next generation technologies in innovative and ethical ways to address real-world challenges in Electronics and Telecommunication Engineering.

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Program Outcome (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design / Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6).

PO6: The Engineer and the World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team Work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

Program Structure for Second Year of Electronics and Telecommunication Engineering
HSNC University (With Effect from 2027-2028)
Semester - III

Course Code	Course Title	Teaching Scheme (Contact Hours)			Credit	EVALUATION SCHEME							
						IA-I	IA-II	IA-I + IA II	End Sem Exam	Exam duration in hrs.	Term Work	Practical & Oral Exam	Total
		L	**T**	**P**									
PC301	Probability and Statistics for Data Science	2	-	--	2	20	20	40	60	2	--	--	100
PC302	Analog and Digital Electronics	3	--	--	3	20	20	40	60	2	--	--	100
PC303	Control Systems and Network Theory	3	--	--	3	20	20	40	60	2	--	--	100
PC304	Integrated Circuits	3	--	--	3	20	20	40	60	2	--	--	100
OE301	Evolution of Science and Technology	2#	--	--	2	10	10	20	30	1	--	–	50
PCL301	Analog and Digital Electronics laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PCL302	Integrated Circuits Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
VSE301	Object Oriented Programming with Python	--	--	2*+2	2	--	--	--	--	--	50	25	75
HSL301	Mini-Project-I	--	--	4$	2	--	--	--	--	--	25	25	50
VECL301	Environmental Science for Engineers (Syllabus common to all Branches).	--	--	2*+2	2	--	--	--	--	--	50	--	50
TOTAL		**13**	**--**	**16**	**21**	**90**	**90**	**180**	**270**	**9**	**175**	**100**	**725**

Institute shall offer an open elective course from the science/ Commerce / Management stream basket provided by HSNC University
* Two hours of practical class to be conducted for full class as demo/discussion.
$ indicates work load of learner (Not faculty). Students can form with minimum 2 and not more than 4 and faculty load will be 1 hour per week per 4 groups

Program Structure for Second Year of Electronics and Telecommunication Engineering
HSNC University (With Effect from 2027-2028)
Semester - IV

Course Code	Course Title	Teaching Scheme (Contact Hours)			Credit	EVALUATION SCHEME							
		L	T	P		IA-I	IA-II	IA-I+ IA-II	End Sem Exam	Exam duration in Hrs.	Term Work	Practical/ Oral Exam	Total
PEC 401	Analog and Digital Communication	3	--	--	3	20	20	40	60	2	--	--	100
PEC 402	Microcontrollers	3	--	--	3	20	20	40	60	2	--	--	100
PEC 403	Data Structures and Algorithm	3	--	--	3	20	20	40	60	2	--	--	100
MD401	Multi-Disciplinary Minor: Behavioral Economics	3	--	--	3	20	20	40	60	2	--	--	100
OE401	Global Supply Chain	2#	--	0	2	10	10	20	30	1	--	--	50
PCL 401	Analog and Digital Communication Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PCL 402	Microcontrollers Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PCL 403	Data Structures and Algorithm Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
MDL 401	Multi-Disciplinary Minor Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
CEP401	Mini-Project II	--	--	4$	2	--	--	--	--	--	25	25	50
EEM 401	Business Model Development (Syllabus common to all Branches)	--	--	2*+2	2	--	--	--	--	--	50	--	50
TOTAL		**14**	**0**	**16**	**22**	**90**	**90**	**180**	**270**	**9**	**175**	**125**	**750**

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Program Structure for Third Year of Electronics and Telecommunication Engineering
HSNC University (With Effect from 2028-2029)
Semester - V

Course Code	Course Title	Teaching Scheme (Contact Hours)				EVALUATION SCHEME							
		L	T	P	Credit	IA-I	IA-II	IA-I + IA-II	End Sem Exam	Exam duration in hrs.	Term Work	Practical/ Oral Exam	Total
PCC 501	Discrete Time Signal Processing	3	--	--	3	20	20	40	60	2	--	--	100
PCC 502	Neural Networks and Machine Learning	3	--	--	3	20	20	40	60	2	--	--	100
PCC 503	Digital VLSI	3	--	--	3	20	20	40	60	2	--	--	100
PE501	Program Electives -I	3	--	--	3	20	20	40	60	2	--	--	100
MD501	Multi-Disciplinary Minor: Financial Accounting	3	--	--	3	20	20	40	60	2	--	--	100
PCL501	Discrete Time Signal Processing Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PCL502	Neural Networks and Machine Learning Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PCL503	Digital VLSI Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PEL501	Program Elective -I Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
MDL502	Multi-disciplinary Minor Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
OE501	International Treaties and Agreements	2#	--	--	2	10	10	20	30	1	--	--	50
CEP 501	Mini-Project III	--	--	4$	2	--	--	--	--	--	25	25	50
TOTAL		**17**	**--**	**14**	**24**	**110**	**110**	**220**	**330**	**11**	**150**	**150**	**850**

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$ indicates work load of learner (Not faculty). Students can form with minimum 2 and not more than 4 and faculty load will be 1 hour per week per 4 groups

Program Electives -I	PEC5011 Computer Communication Networks PEC5012 Data Compression and Cryptography PEC5013 Data Base Management System	PEL5011 Computer Communication Networks Lab PEL5012 Data Compression and Cryptography Lab PEL5013 Data Base Management System Lab

Program Structure for Third Year of Electronics and Telecommunication Engineering
HSNC University (With Effect from 2028-2029)
Semester - VI

Course Code	Course Title	Teaching Scheme (Contact Hours)				EVALUATION SCHEME							
		L	T	P	Credit	IA-I	IA-II	IA-I + IA-II	End Sem Exam	Exam duration in hrs.	Term Work	Practical /Oral Exam	Total
PC601	Electrostatics and Magnetics	3	--	--	3	20	20	40	60	2	--	--	100
PC602	Mobile and wireless Communication	3	--	--	3	20	20	40	60	2	--	--	100
PE601	Program Elective II	3	--	--	3	20	20	40	60	2	--	--	100
PE602	Program Elective III	3			3	20	20	40	60	2	--	--	100
MD601	Multi-Disciplinary Minor: UPI and FinTech	3	--	--	3	20	20	40	60	2	--	--	100
PCL601	Electrostatics and Magnetics Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PCL602	Mobile and wireless Communication Laboratory	--	--	2	1	--	-	--	--	--	25	25	50
PEL601	Program Electives -II Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PEL602	Program Electives -III Laboratory			2	1	--	-	--	--	--	25	25	50
MDL601	Multi-disciplinary Minor Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
VSE601	Mini-project IV	--	--	4$	2	--	--	--	--	--	25	25	50
AEC601	AI Enabled Circuit Design	--	--	2*+2	2	--	-	--	--	--	50	--	50
TOTAL		**15**		**18**	**24**	**100**	**100**	**200**	**300**	**10**	**200**	**150**	**850**

* Two hours of practical class to be conducted for full class as demo/discussion.
$ indicates work load of learner (Not faculty). Students can form with minimum 2 and not more than 4 and faculty load will be 1 hr per week per 4 groups

Program Electives -II	PEC6011 Digital Image Processing & Machine Vision PEC6012 Mixed Signal VLSI PEC6013 Big Data Analytics	PEL6011 Digital Image Processing & Machine Vision Lab PEL6012 Mixed Signal VLSI Lab PEL6013 Big Data Analytics Lab
Program Electives -III	PEC6021 Deep Learning PEC6022 AI in Remote Sensing PEC6023 Electric Vehicle Technology	PEL6021 Deep Learning Lab PEL6022 AI in Remote Sensing Lab PEL6023 Electric Vehicle Technology Lab

Program Structure for Third Year of Electronics and Telecommunication Engineering
HSNC University (With Effect from 2029-2030)
Semester - VII

Course Code	Course Title	Teaching Scheme (Contact Hours)				EVALUATION SCHEME							
		L	T	P	Credit	IA-I	IA-II	IA-I+ IA-II	End Sem Exam	Exam duration in hrs.	Term Work	Practical /Oral Exam	Total
PC701	Microwave Engineering	3	--	--	3	20	20	40	60	2	--	--	100
PEC701	Program Elective IV	3	--	--	3	20	20	40	60	2	--	--	100
PCL701	Microwave Engineering Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
PEL701	Program Elective IV Laboratory	--	--	2	1	--	--	--	--	--	25	25	50
MDL701	Banking and Insurance Lab	--	--	2*2	2	--	--	--	--	--	50	25	75
PC701	Major Project- I	--	--	4	2	--	--	--	--	--	50	50	100
II701	Industry Internship / In-house Internship Project	Entire Semester --			6	--	--	--	--	--	100	100	200
	TOTAL	**6**	**--**	**12**	**18**	**40**	**40**	**80**	**120**	**4**	**250**	**225**	**675**

* Two hours of lecture class to be conducted for full class as demo/discussion.

Program Electives -IV	PEC7011 Antenna and Wave Propagation PEC7012 Robotics & Drone Technology PEC7013 Natural Language Processing	PEL7011 Antenna and Wave Propagation Lab PEL7012 Robotics & Drone Technology Lab PEL7013 Natural Language Processing Lab

Program Structure for Third Year of Electronics and Telecommunication Engineering
HSNC University (With Effect from 2029-2030)
Semester - VIII

Course Code	Course Title	Teaching Scheme (Contact Hours)				EVALUATION SCHEME							
		L	T	P	Credit	IA-I	IA-II	IA-I + IA-II	End Sem Exam	Exam duration in hrs.	Term Work	Practical /Oral Exam	Total
PC801	Optical Communication and Networking	3	--	--	3	20	20	40	60	2	--	--	100
PE801	Program Electives -V	3	--	--	3	20	20	40	60	2	--	--	100
PCL801	Optical Communication and Networking Lab	--	--	2	1	--	--	--	--	--	25	25	50
PEL801	Program Electives -V Lab	--	--	2	1	--	--	--	--	--	25	25	50
PC801	Major Project- II	--	--	4	2	--	--	--	--	--	50	50	100
EL802	Industry Internship / In-house Internship Project	Entire Semester			6	--	--	--	--	--	100	100	200
TOTAL		**6**	**--**	**8**	**16**	**40**	**40**	**80**	**120**	**4**	**200**	**200**	**600**

Program Electives -V	PEC8011 System on Chip Design PEC8012 Satellite and Nano Satellite Communication PEC8013 Quantum Computing	PEL8011 System on Chip Design Lab PEL8012 Satellite and Nano Satellite Communication Lab PEL8013 Quantum Computing Lab