VIT Vidyalankar Institute of Technology
Accredited A+ by NAAC

Vidyalankar Institute of Technology

An Autonomous Institute affiliated to University of Mumbai

Bachelor of Technology

in

Electronics & Telecommunication Engineering

Programme Structure

(As per NEP GR, with effect from the Academic Year 2023-24)

Preamble

The National Education Policy (NEP) framework aims to break the mould from teacher centric to student centric educational practices. It empowers the students with flexibility in terms of choosing courses across different faculties and modes of learning.

This multidisciplinary approach will encourage learners to follow their passion and inherent interests. The learner is free to learn at a pace that he is comfortable with, and this enables lifelong learning. It also enhances the scope for holistic personality development.

This premise is truly reflected in preamble of the NEP document, "The future of nation is decided in the classrooms of the schools and colleges today".

Details of implementation:

NEP curriculum framework enables us to accelerate change, redesign systems with equity in mind, respond to feedback, encourage collaboration, catch, and pollinate ideas and create a culture of research and development. It will allow us to offer the required academic flexibility which will focus on improving competency level of students with diverse strengths.

The curriculum planned by VIT has vertical Program Courses consisting of core courses (PCC) of branch of engineering positioned and sequenced to achieve sequential and integral learning of the entire breadth of the specific branch. This vertical also includes Professional elective courses (PEC) which 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 special feature of this curricula ensuring employability.

The vertical Multidisciplinary Courses consists of Open Elective (OE) courses and Multidisciplinary Minor (MD M) courses. Special vocational and skill development courses are included as a part of Skill courses vertical that make student capable to work in industrial environment.

The student is expected to demonstrate their ability through courses in Experiential Learning Courses vertical like internships/On Job Training, Community Engagement Project, Real Industry Project/ research problem. Our curriculum also introduces Social Service Internship and Internship with institutes abroad along with courses like Design Thinking. This will lead to the creation of products and/ or patents through this program.

For holistic development of students, apart from technical courses, Ability Enhancement Courses, Entrepreneurship/Economics/Management Courses, Indian Knowledge System and Value Education courses from vertical Humanities and Social Science and Management develop the required soft-skills and attitude amongst learners.

In Liberal Learning vertical, courses like Various Dance Forms, Global citizenship Education, Facets of Astronomy etc. aim to create balance in brain hemispheres and hence improve learners' clarity in thoughts and responses.

In addition to core courses, professional and open electives; our framework offers honor degree in each programme of engineering. It includes specialized courses along with field/ domain study that make students capable of working on industry relevant problems.

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

Chairman, Academic Council
Vidyalankar Institute of Technology

VERTICAL BASED CREDIT ALLOTMENT

Sr. No.	Verticals	Buckets	Credits
I	BSC/ESC	Basic Science	15
		Engineering Science	12
II	Program Courses	Programme Core Courses (PCC)	48
		Programme Elective Courses (PEC)	18
III	Multidisciplinary Courses	Multidisciplinary Minor (MDM)	14
IV		Open Electives (OE)	8
V	Skill Courses	Vocational and Skill Enhancement Courses (VSEC)	8
VI	Humanities Social Science and Management (HSSM)	Ability Enhancement Courses (AEC-01, AEC-02)	4
		Entrepreneurship/Economics/Management Courses	5
		Indian Knowledge System (IKS)	2
		Value education Courses (VEC)	3
VII	Experiential Learning Courses	Research Methodology	3
		Community Engagement Project (CEP)/Field Project (FP)	2
		Project	4
		Internship/OJT	13
	Liberal Learning Courses	Co-curricular Courses (CC)	4
Total			**163**

Learner is expected to complete requirement of 163 credits (with minimum credits under each category as mentioned above) for B.Tech. degree in Electronics and Telecommunication Engineering with Multidisciplinary Minor.

Additionally, learners can choose to avail i) B.Tech. in Electronics and Telecommunication Engineering – Honors and Multidisciplinary Minor or ii) B.Tech. in Electronics and Telecommunication Engineering - Honours with Research and Multidisciplinary Minor or iii) B.Tech. in Electronics and Telecommunication Engineering with Double Minors (Multidisciplinary and Specialization Minor) Degree by completing requirements of 18 credits, which will be over and above the 163 credits required for B.Tech. with Multidisciplinary Minor degree.

Definition of Credit

Duration	Credit
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 Baskets

I. Basic Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	BS16T*	Engineering Chemistry	2	-	-	2	1
2	BS16P*	Engineering Chemistry Lab	-	2	-	1	1
3	BS02*	Engineering Mathematics- I	3	-	-	3	1
4	BS15T*	Engineering Physics	2	-	-	2	2
5	BS15P*	Engineering Physics Lab	-	2	-	1	2
6	BS04*	Engineering Mathematics-II	3	-	-	3	2
7	BS43	Engineering Mathematics-III	3	-	-	3	3

*** Courses exempted for Direct Second Year (DSY) students who will secure admission through lateral entry from the A.Y. 2024-25 onwards.**

II. Engineering Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ES02T*	Engineering Mechanics	2	-	-	2	1
2	ES02P*	Engineering Mechanics Lab	-	2	-	1	1
3	ES08T*	Basic Electrical & Electronics Engineering	2	-	-	2	1
4	ES08P*	Basic Electrical & Electronics Engineering Lab	-	2	-	1	1
5	ES09T*	Logic Circuit	2	-	-	2	2
6	ES09P*	Logic Circuit Lab	-	2	-	1	2
7	ES01T*	Engineering Graphics	2	-	-	2	2
8	ES01P*	Engineering Graphics Lab	-	2	-	1	2

*** Courses exempted for Direct Second Year (DSY) students who will secure admission through lateral entry from the A.Y. 2024-25 onwards.**

III. Program Core Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET01T	Electronic Devices and Circuits	2	-	-	2	3
2	ET01P	Electronic Devices and Circuits Lab	-	2	-	1	3
3	ET02T	Principles of Communication Engineering	2	-	-	2	3
4	ET02P	Principles of Communication Engineering Lab	-	2	-	1	3
5	ET100T	Signal and Systems	2	-	-	2	4
6	ET100P	Signal and Systems Lab		2	-	1	4
7	ET101T	Network Theory and Transmission lines	2	-	-	2	3
8	ET101P	Network Theory and Transmission lines Lab	-	2	-	1	3
9	ET102T	Microprocessor & Microcontroller	2	-	-	2	3
10	ET102P	Microprocessor & Microcontroller Lab	-	2	-	1	3
11	ET06T	Integrated Circuits	2	-	-	2	4
12	ET06P	Integrated Circuits Lab	-	2	-	1	4
13	ET07T	Data Structure & Analysis of Algorithm	2	-	-	2	4
14	ET07P	Data Structure & Analysis of Algorithm Lab	-	2	-	1	4
15	ET09T	Digital Communication	2	-	-	2	4
16	ET09P	Digital Communication Lab	-	2	-	1	4
17	ET10T	Digital Signal Processing	2	-	-	2	5
18	ET10P	Digital Signal Processing Lab	-	2	-	1	5
19	ET103T	Electromagnetics and Antenna	2	-	-	2	5
20	ET103P	Electromagnetics and Antenna Lab	-	2	-	1	5

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
21	ET104T	RF and Microwave Engineering	2	-	-	2	6
22	ET104P	RF and Microwave Engineering Lab	-	2	-	1	6
23	ET105T	Optical Communication	2	-	-	2	7
24	ET105P	Optical Communication Lab	-	2	-	1	7
25	ET14T	Mobile Communication	2	-	-	2	6
26	ET14P	Mobile Communication Lab	-	2	-	1	6
27	ET16T	Computer Communication Network	2	-	-	2	5
28	ET16P	Computer Communication Network Lab	-	2	-	1	5
29	ET18T	Basic VLSI Design	2	-	-	2	5
30	ET18P	Basic VLSI Design Lab	-	2	-	1	5
31	ET106T	Mathematical theory of Communication	2	-	-	2	4
32	ET106P	Mathematical theory of Communication Lab	-	2	-	1	4

IV. Professional Elective Courses

Name of the track: Communication Engineering

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET20T	Modelling and Analysis of Communication System	2	-	-	2	5
2	ET20P	Modelling and Analysis of Communication System Lab	-	2	-	1	5
3	ET21T	Telecommunication Network Management	2	-	-	2	6
4	ET21P	Telecommunication Network Management Lab	-	2	-	1	6
5	ET22T	Tracking System	2	-	-	2	6
6	ET22P	Tracking System Lab	-	2	-	1	6
7	ET23T	OFDM and MIMO Technology	2	-	-	2	7
8	ET23P	OFDM and MIMO Technology Lab	-	2	-	1	7
9	ET24T	Satellite Communication	2	-	-	2	7
10	ET24P	Satellite Communication Lab	-	2	-	1	7
11	ET25T	Wireless sensor networks	2	-	-	2	7
12	ET25P	Wireless sensor networks Lab	-	2	-	1	7

Name of the track: Data Analytics and Machine Learning

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET26T	Database Management System	2	-	-	2	5
2	ET26P	Database Management System Lab	-	2	-	1	5
3	ET27T	Introduction to Data Analytics	2	-	-	2	6
4	ET27P	Introduction to Data Analytics Lab	-	2	-	1	6
5	ET28T	Machine Learning	2	-	-	2	6
6	ET28P	Machine Learning Lab	-	2	-	1	6

7	ET29T	Data Mining	2	-	-	2	7
8	ET29P	Data Mining Lab	-	2	-	1	7
9	ET30T	Big data Analytics	2	-	-	2	7
10	ET30P	Big data Analytics Lab	-	2	-	1	7
11	ET31T	Deep Learning	2	-	-	2	7
12	ET31P	Deep Learning Lab	-	2	-	1	7

Name of the track: Internet of Thing

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET32T	Modern Sensors for Internet of Thing	2	-	-	2	5
2	ET32P	Modern Sensors for Internet of Thing Lab	-	2	-	1	5
3	ET33T	Principles of Internet of Things (IoT)	2	-	-	2	6
4	ET33P	Principles of Internet of Things (IoT)Lab	-	2	-	1	6
5	ET34T	Embedded System Design with Tiny Operating System (OS)	2	-	-	2	6
6	ET34P	Embedded System Design with Tiny Operating System Lab	-	2	-	1	6
7	ET35T	Internet of Things (IoT) and Edge Computing	2	-	-	2	7
8	ET35P	Internet of Things (IoT) and Edge Computing Lab	-	2	-	1	7
9	ET36T	Internet of Things (IoT) Security and Trust	2	-	-	2	7
10	ET36P	Internet of Things (IoT) Security and Trust Lab	-	2	-	1	7
11	ET37T	Industrial Internet of Things (IIoT)	2	-	-	2	7
12	ET37P	Industrial Internet of Things (IIoT) Lab	-	2	-	1	7

Name of the track: Very Large-Scale Integration Design (VLSID)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET38T	Digital System Design	2	-	-	2	5
2	ET38P	Digital System Design Lab	-	2	-	1	5

3	ET39T	Advanced VLSI Design and Technology	2	-	-	2	6
4	ET39P	Advanced VLSI Design and Technology Lab	-	2	-	1	6
5	ET40T	Analog IC Design	2	-	-	2	6
6	ET40P	Analog IC Design Lab	-	2	-	1	6
7	ET41T	ASIC and Verification	2	-	-	2	7
8	ET41P	ASIC and Verification Lab	-	2	-	1	7
9	ET42T	System on Chip	2	-	-	2	7
10	ET42P	System on Chip Lab	-	2	-	1	7
11	ET43T	Mixed signal VLSI	2	-	-	2	7
12	ET43P	Mixed signal VLSI Lab	-	2	-	1	7

V. Multidisciplinary Minor (MDM)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OE02	Project Management	3	-	-	3	7 or 8
2	OE03	Product Lifecycle Management	3	-	-	3	7 or 8
3	OE04	Sustainability Management	3	-	-	3	7 or 8
4	GESB07	Psychology	3	-	-	3	6 or 7 or 8
5	GENS02	Modern Farming	3	-	-	3	6 or 7 or 8
6	EC28T	Digital Image Processing	2	-	-	2	6
7	EC28P	Digital Image Processing Lab	1			1	6
8	EC35T	Robotics	2	-	-	2	6 or 7 or 8
9	EC35P	Robotics Lab	1	-	-	1	6 or 7 or 8
10	CE07T	Operating System	2	-	-	2	6 or 7 or 8
12	CE07P	Operating System Lab	1	-	-	1	6 or 7 or 8
13	CE14T	Cloud Computing	2	-	-	2	6 or 7 or 8
14	CE14P	Cloud Computing Lab	1	-	-	1	6 or 7 or 8

VI. Open Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OE01	Cyber Law	3	-	-	3	6 or 7 or 8
2	OE05	Operation Research	3	-	-	3	6 or 7 or 8
3	OE06	IPR and Patenting	2	-	-	2	6 or 7 or 8
4	OE08	Renewable Energy Management	3	-	-	3	6 or 7 or 8
5	OE09	Energy Audit and Management	3	-	-	3	6 or 7 or 8
6	OE10	E-Farming	2	-	-	2	6 or 7 or 8
7	OE11	Bioinformatics	3	-	-	3	6 or 7 or 8
8	OE12	Nanotechnology	3	-	-	3	6 or 7 or 8

VII. Vocational and Skill Enhancement Courses (VSEC)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ES04T	Structured Programming	2	-	-	2	1
2	ES04P	Structured Programming Lab	1	-	-	1	1
3	ES05T	Object Oriented Programming	2	-	-	2	2
4	ES05P	Object Oriented Programming Lab	1	-	-	1	2
5	ET08	Instrumentation and Control Systems Lab	1	-	-	1	3
6	ET17	Skill Based Lab	1	-	-	1	3

VIII. Ability Enhancement Courses (AEC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	HS01T	Effective Communication	2	-	-	2	Any
2	HS01P	Effective Communication Lab	-	2	-	1	Any
3	HS07	Technical Communication	-	2	-	1	Any
4	GEA01	Voice Culture for Professional Speaking	2	-	-	2	Any

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
5	GESB04	Corporate and Social Etiquettes	2	-	-	2	Any
6	GE01$	Internship with other Institutes (Credit Transfer)	Minimum 120 hours			4	SE Break

$ For GE01- Internship with other Institutes (Credit Transfer): Internship with other reputed institutes equivalent to 4 credits is recommended to be done by learner during second year inter semester break (i.e., summer break between semester 4 and semester 5).

IX. Entrepreneurship/ Economics/ Management Courses (EEMC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	HS08	Engineering Economics	2	-	-	2	6
2	GECI01	Design Thinking	3	-	-	3	2
3	GECI02	Innovation and Entrepreneurship	1	-	-	1	Any
4	GEF01	Basics of Finance & Legal aspects for Business	2	-	-	2	Any
5	GEF02	Financial Management for beginners	2	-	-	2	Any

X. Indian Knowledge System Courses (IKS)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	GEA03	Exploring Indian Art	2	-	-	2	Any
2	GESB03	Indian Traditional Knowledge System	2	-	-	2	Any
3	GEPS01	Indian Constitution	2	-	-	2	Any

XI. Value Education Courses (VEC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	HS05	E-Waste and Environmental Management	2	-	-	2	Any
2	HS02T	Professional Skills	2	-	-	2	Any
3	HS02P	Professional Skills Lab	-	2	-	1	Any
4	GESB02	Universal Human Values	2	-	-	2	Any
5	GESB06	Responsibility towards sustainable environment	2	-	-	2	Any

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
6	GEPS02	Four Pillars of Democratic Nation	2	-	-	2	Any
7	GEWI01	Railways - Wonders of Infrastructure	2	-	-	2	Any

XII. Experiential Learning Courses (ELC)- Research Methodology (RM)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OE07	Research Methodology	3	-	-	3	7 or 8

XIII. Experiential Learning Courses (ELC)- Comm. Eng. Project (CEP)/ Field Project (FP)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	GESB01	Social Service Internship/ Project	2	-	-	2	4

 # For GESB01- Social Service Internship/ Project: 2 hours / week slot will be provided during the semester (in regular timetable). Additional work of 60 hours needs to be completed during the semester (besides regular timetable) or after the semester (during inter semester break).

XIV. Experiential Learning Courses (ELC)- Project

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET49	Project-2 (Final)	-	4	-	4	7

XV. Experiential Learning Courses (ELC)- Internship/ OJT

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET45	Mini Project- 1 (Hardware)	-	4	-	2	4
2	ET46	Mini Project- 2 (Software)	-	4	-	2	5
3	ET47	Industry Internship	-	150 (Total)	-	6	7 or 8
4	ET48	Project-1 (Synopsis)	3	-	-	3	6

XVI. Liberal Learning Courses (LLC)- Co-curricular Courses (CC)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	GEA02	Various Dance Forms	2	-	-	2	Any
2	GESB05	Global Citizenship Education	-	2	-	1	Any
3	GEPEW01	Wellness – Body, Mind & Spirit	2	-	-	2	Any
4	GEPEW02	IQ vs EQ		2	-	1	Any
5	GEPEW03	Nutrition and Physical Wellness	-	2	-	1	Any
6	GENS01	Facets of Astronomy	-	2	-	1	Any

Illustrative Semester wise

Credit Distribution Structure and Assessment Guidelines

(Based on NEP 2020 Guidelines)

for

Bachelor of Technology

in

Electronics and Telecommunication Engineering-One Major, One Minor

Semester wise credit distribution For B. Tech in Electronics and Telecommunication Engineering with Multidisciplinary Minor

Semester		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total Credits**
Sub-Category	**Verticals**									
Basic Science Course	BSC/ ESC	6	6	3						15
Engineering Science		6	6							12
Programme Core Course (PCC)	Program Courses (PC)			12	15	12	6	3		48
Programme Elective Course (PEC)						3	6	9		18
Multidisciplinary Minor (MDM)	Multidisciplinary Courses (MDC)					3	3	3	5	14
Open Elective (OE)									8	8
Vocational and Skill Enhancement Courses (VSEC)	Skill Courses (SC)	3	3	2						8
Ability Enhancement Courses (AEC)	Humanities Social Science and Management (HSSM)	3		1						4
Entrepreneurship/ Economics/ Management Courses (EEMC)			3				2			5
Indian Knowledge System (IKS)				2						2
Value Education Courses (VEC)			3							3
Research Methodology (RM)	Experiential Learning Courses (ELC)								3	3
Comm. Eng. Project (CEP)/ Field Project (FP)					2					2
Project								4		4
Internship/ OJT					2	2	3		6	13
Co-curricular Courses (CC)	Liberal Learning Courses (LLC)	2	2							4
Total Credits		20	23	20	19	20	20	19	22	163

First Year B. Tech. Electronics and Telecommunication Engineering **Preferred Semester: I**

Course Structure and Assessment Guidelines

Course			Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Verticals	Code	Name			ISA	MSE	ESE	
BSC	BS16T	Engineering Chemistry	Theory	2	15	20	40	075
	BS16P	Engineering Chemistry Lab	Practical	1	25	-	25	050
	BS02	Engineering Mathematics-I	Theory	3	20	30	50	100
ESC	ES02T	Engineering Mechanics	Theory	2	15	20	40	075
	ES02P	Engineering Mechanics Lab	Practical	1	25	-	25	050
	ES08T	Basic Electrical & Electronics Engineering	Theory	2	15	20	40	075
	ES08P	Basic Electrical & Electronics Engineering Lab	Practical	1	25	-	25	050
SC_VSEC	ES04T	Structured Programming	Theory	2	15	20	40	075
	ES04P	Structured Programming Lab	Practical	1	25	-	25	050
HSSM_AEC	HSXXT*	Any HSSM_AEC Course	Theory	2	15	20	40	075
	HSXXP*		Practical	1	25	-	25	050
LLC-CC	GEXXX*	Any one CC course offered in the semester	As per Course	2	As per Course			075
Total Credits				**20**				

ISA=In Semester Assessment, MSE=Mid Semester Examination, ESE=End Semester Examination

*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned above. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

First Year B. Tech. Electronics and Telecommunication Engineering Preferred Semester: II
Structure and Assessment Guidelines

Course			Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Vertical	Code	Name			ISA	MSE	ESE	
BSC	BS15T	Engineering Physics	Theory	2	15	20	40	075
	BS15P	Engineering Physics Lab	Practical	1	25	-	25	050
	BS04	Engineering Mathematics-II	Theory+ Tutorial	3	20	30	50	100
ESC	ES01T	Engineering Graphics	Theory	2	15	20	40	075
	ES01P	Engineering Graphics Lab	Practical	1	25	-	25	050
	ES09T	Logic Circuits	Theory	2	15	20	40	075
	ES09P	Logic Circuits Lab	Practical	1	25	-	25	050
SC-VSEC	ES05T	Object Oriented Programming	Theory	2	15	20	40	075
	ES05P	Object Oriented Programming Lab	Practical	1	25	-	25	050
HSSM_VEC	HSXXT	Any HSSM_VEC Course	Theory	2	15	20	40	075
	HSXXP		Practical	1	25	-	25	050
HSSM_EEMC	GEXXX*	Any one HSSM course offered in the semester	As per course	3	As per course			100
LLC-CC	GEXXX*	Any one CC offered in the semester	As per course	2	As per course			075
Total Credits				**23**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned above. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

Second Year B. Tech. Electronics & Telecommunication Engineering Preferred Semester: III

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Vertical	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
BSC	BS43	Engineering Mathematics-III	Theory	3	20	30	50	100
PC_PCC	ET102T	Microprocessor and Microcontroller	Theory	2	15	20	40	075
	ET102P	Microprocessor and Microcontroller Lab	Practical	1	25	-	25	050
	ET01T	Electronic Devices and Circuits	Theory	2	15	20	40	075
	ET01P	Electronic Devices and Circuits Lab	Practical	1	25	-	25	050
	ET02T	Principles of Communication Engineering	Theory	2	15	20	40	075
	ET02P	Principles of Communication Engineering Lab	Practical	1	25	-	25	050
	ET101T	Network Theory and Transmission lines	Theory	2	15	20	40	075
	ET101P	Network Theory and Transmission lines lab	Practical	1	25	-	25	050
SC-VSEC	ET08	Instrumentation and Control Systems lab	Practical	1	25	-	25	050
	ET17	Skill Based Lab	Practical	1	50	-	-	050
HSSM_AEC	HS07	Technical Communication	Practical	1	50	-	-	050
HSSM_IKS	GEXXX*	Any HSSM_IKS course	Theory	2	As per course			075
Total Credits				20				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination

*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

Second Year B. Tech. Electronics & Telecommunication Engineering Preferred Semester: IV
Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@ 40% of total marks)
NEP-Vertical	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	ET106T	Mathematical theory of Communication	Theory	2	15	20	40	075
	ET106P	Mathematical theory of Communication Lab	Practical	1	25	-	25	050
	ET07T	Data Structures and Analysis of Algorithms	Theory	2	15	20	40	075
	ET07P	Data Structures and Analysis of Algorithms Lab	Practical	1	25	-	25	050
	ET06T	Integrated Circuits	Theory	2	15	20	40	075
	ET06P	Integrated Circuits Lab	Practical	1	25	-	25	050
	ET09T	Digital Communication	Theory	2	15	20	40	075
	ET09P	Digital Communication Lab	Practical	1	25	-	25	050
	ET100T	Signal and systems	Theory	2	15	20	40	075
	ET100P	Signal and systems Lab	Practical	1	25	-	25	050
ELC_INT/OJ	ET45	Mini Project 1 (Hardware)	Practical	2	25	-	50	075
ELC-CEP	GEXXX*	CEP/FP course	As per course	2	As per course			
Total Credit				19				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

Third Year B. Tech. Electronics & Telecommunication Engineering **Preferred Semester: V**

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	ET18T	Basic VLSI Design	Theory	2	15	20	40	075
	ET18P	Basic VLSI Design Lab	Practical	1	25	-	25	050
	ET16T	Computer Network	Theory	2	15	20	40	075
	ET16P	Computer Network Lab	Practical	1	25	-	25	050
	ET10T	Digital Signal Processing	Theory	2	15	20	40	075
	ET10P	Digital Signal Processing Lab	Practical	1	25	-	25	050
	ET103T	Electromagnetics and Antenna	Theory	2	15	20	40	075
	ET103P	Electromagnetics and Antenna Lab	Practical	1	25	-	25	050
PC_PEC	ETXXT	Professional Elective-1	Theory	2	15	20	40	075
	ETXXP	Professional Elective-1 Lab	Practical	1	25	-	25	050
MDM	XX*	As per MDM course list	As per course	3	As per course			
ELC_INT/OJ	ET46	Mini-Project 2	Practical	2	25	-	50	075
Total Credit				20				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

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 total four track. The learners can choose one track from tracks offered by department.

Professional Elective-1 courses:

Course Code	Course Name	Specialization Track Name #
ET20T	Modelling and Analysis of Communication System	Communication Engineering
ET20P	Modelling and Analysis of Communication System Lab	
ET26T	Database Management System	Data Analytics and Machine Learning
ET26P	Database Management System Lab	
ET32T	Modern Sensors for Internet of Thing	IoT
ET32P	Modern Sensors for Internet of Thing Lab	
EC38T	Digital System Design	VLSI Design
EC38P	Digital System Design Lab	

For details of Specialization Certificate, refer Appendix - A

Third Year B. Tech. Electronics & Telecommunication Engineering **Preferred Semester: VI**

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	ET14T	Mobile Communication	Theory	2	15	20	40	075
	ET14P	Mobile Communication Lab	Practical	1	25	-	25	050
	ET104T	RF and Microwave Engineering	Theory	2	20	30	50	100
	ET104P	RF and Microwave Engineering Lab	Practical	1	25	-	25	050
PC_PEC	ETXXT	Professional Elective-2	Theory	2	15	20	40	075
	ETXXP	Professional Elective-2 Lab	Practical	1	25	-	25	050
	ETXXT	Professional Elective-3	Theory	2	15	20	40	075
	ETXXP	Professional Elective-3 Lab	Practical	1	25	-	25	050
MDM	XX*	As per MDM course list	As per course	3	As per course			
HSSM_EEMC	HS08	Engineering Economics	Theory	2	15	20	40	075
ELC_INT/OJT		Project-1 (Synopsis)	Theory	3	50	-	50	100
Total Credit				**20**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination

*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

List of Professional Elective 2 Courses:

Course Code	Course Name	Specialization Track Name #
ET21T	Telecommunication Network Management	Communication Engineering
ET21P	Telecommunication Network Management Lab	
ET27T	Introduction to Data Analytics	Data Analytics and Machine Learning
ET27P	Introduction to Data Analytics Lab	
ET33T	Principles of Internet of Things (IoT)	IoT
ET33P	Principles of Internet of Things (IoT)Lab	
ET39T	Advanced VLSI Design and Technology	VLSI Design
ET39P	Advanced VLSI Design and Technology Lab	

List of Professional Elective 3 Courses:

Course Code	Course Name	Specialization Track Name #
ET22T	Tracking Systems	Communication Engineering
ET22P	Tracking Systems Lab	
ET28T	Machine Learning	Data Analytics and Machine Learning
ET28P	Machine Learning Lab	
ET34T	Embedded System Design with Tiny Operating System	IoT
ET34P	Embedded System Design with Tiny Operating System Lab	
EC40T	Analog IC Design	VLSI Design
EC40P	Analog IC Design Lab	

#For details of Specialization Certificate, refer Appendix-A

Final Year B. Tech. Electronics & Telecommunication Engineering Preferred Semester: VII

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	ET105T	Optical Communication	Theory	2	15	20	40	075
	ET105P	Optical Communication Lab	Practical	1	25	-	25	050
PC_PEC	ETXXT	Professional Elective-4	Theory	2	15	20	40	075
	ETXXP	Professional Elective-4 Lab	Practical	1	25	-	25	050
	ETXXT	Professional Elective-5	Theory	2	15	20	40	075
	ETXXP	Professional Elective-5 Lab	Practical	1	25	-	25	050
	ETXXT	Professional Elective-6	Theory	2	15	20	40	075
	ETXXP	Professional Elective-6 Lab	Practical	1	25	-	25	050
MDM	XX*	As per MDM course list	As per course	3	As per course			
Project	ET49	Project 2 (Final)	Theory	4	75	-	50	125
Total Credit				**19**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

List of Professional Elective 4 Courses:

Course Code	Course Name	Specialization Track Name #
ET23T	OFDM and MIMO Technology	Communication Engineering
ET23P	OFDM and MIMO Technology Lab	
ET29T	Data Mining	Data Analytics and Machine Learning
ET29P	Data Mining Lab	
ET35T	Internet of Things (IoT) and Edge Computing	IoT
ET35P	Internet of Things (IoT) and Edge Computing Lab	
EC41T	ASIC and Verification	VLSI Design
EC41P	ASIC and Verification Lab	

List of Professional Elective 5 Courses:

Course Code	Course Name	Specialization Track Name #
ET24T	Satellite Communication	Communication Engineering
ET24P	Satellite Communication Lab	
ET30T	Big data Analytics	Data Analytics and Machine Learning
ET30P	Big data Analytics Lab	
ET36T	Internet of Things (IoT) Security and Trust	IoT
ET36P	Internet of Things (IoT) Security and Trust Lab	
EC42T	System on Chip	VLSI Design
EC42P	System on Chip Lab	

List of Professional Elective 6 Courses:

Course Code	Course Name	Specialization Track Name #
ET25T	Wireless sensor networks	Communication Engineering
ET25P	Wireless sensor networks Lab	
ET31T	Deep Learning	Data Analytics and Machine Learning
ET31P	Deep Learning Lab	
ET37T	Industrial Internet of Things (IIoT)	IoT
ET37P	Industrial Internet of Things (IIoT) Lab	
ET43T	Mixed signal VLSI	VLSI Design
ET43P	Mixed signal VLSI Lab	

#For details of Specialization Certificate, refer Appendix-A

Final Year B. Tech. Electronics & Telecommunication Engineering **Preferred Semester: VIII**

Course Structure and Assessment Guidelines

	Course		**Head of Learning**	**Credits**	**Assessment guidelines (Marks)**			**Total marks (Passing@40% of total marks)**
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
MDC_OE	OEXX*	Any three from the offered Open Elective courses	Theory	3	20	30	50	100
MDC_OE	OEXX*		Theory	3	20	30	50	100
MDC_OE	OEXX*		Theory	2	15	20	40	075
ELC_INT/OJT	ET47	Industry Internship	Theory	6	20	30	50	100
ELC_RM	OE07	Research Methodology	Theory	3	20	30	50	100
MDM	XX*	As per MDM course list	As per course	3	As per Course			
MDM	XX*	As per MDM course list	As per course	2	As per Course			
Total Credit				**22**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

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 (both theory and practical components) as a part of requirement for B.Tech. degree.

Specialization Certificate is introduced to build competency of learners in the chosen domain. Department of Electronics & Telecommunication Engineering, along with other departments of the Institute, offers the following specialization tracks for the students of EXTC department:

Sr. No.	Specialization Track Name	Offered By the Department of
1	Communication Engineering	Electronics & Telecommunication Engineering
2	Data Analytics and Machine Learning	Electronics & Telecommunication Engineering
3	Internet of Things (IoT)	Electronics & Telecommunication Engineering
4	Very Large Scale Integrated Design (VLSID)	Electronics & Computer Engineering

We are offering total six professional electives from semester 5 to 7. The learner must choose one course in semester 5, two courses in semester 6 and three courses in semester 7, from selected specialization track to fulfil the required credits for the award of degree.
Student must follow the same track once opted.
If learners complete all Professional Elective courses from the same chosen track, they will be eligible to receive a Specialization Certificate from the Institute.

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

Communication Engineering track: Courses to be chosen for specialization in Communication Engineering track

Semester	Course Code	Course Name
V	ET20T	Modelling and Analysis of Communication System
V	ET20P	Modelling and Analysis of Communication System Lab
VI	ET21T	Telecommunication Network Management
VI	ET21P	Telecommunication Network Management Lab
VI	ET22T	Tracking System
VI	ET22P	Tracking System Lab
VII	ET23T	OFDM and MIMO Technology
VII	ET23P	OFDM and MIMO Technology Lab
VII	ET24T	Satellite Communication
VII	ET24P	Satellite Communication Lab
VII	ET25T	Wireless sensor networks
VII	ET25P	Wireless sensor networks Lab

Data Analytics and Machine Learning track: Courses to be chosen for specialization in Data Analytics and Machine Learning

Semester	Course Code	Course Name
V	ET26T	Database Management System
V	ET26P	Database Management System Lab
VI	ET27T	Introduction to Data Analytics
VI	ET27P	Introduction to Data Analytics Lab
VI	ET28T	Machine Learning
VI	ET28P	Machine Learning Lab
VII	ET29T	Data Mining
VII	ET29P	Data Mining Lab
VII	ET30T	Big data Analytics
VII	ET30P	Big data Analytics Lab
VII	ET31T	Deep Learning
VII	ET31P	Deep Learning Lab

IoT track: Courses to be chosen for specialization in Internet of Thing (IoT)

Semester	Course Code	Course Name
V	ET32T	Modern Sensors for IOT
V	ET32P	Modern Sensors for IOT Lab
VI	ET33T	Principles of IOT
VI	ET33P	Principles of IOT Lab
VI	ET34T	Embedded System Design with tiny OS
VI	ET34P	Embedded System Design with tiny OS Lab
VII	ET35T	IoT and Edge Computing
VII	ET35P	IoT and Edge Computing Lab
VII	ET36T	IoT Security and Trust
VII	ET36P	IoT Security and Trust Lab
VII	ET37T	Industrial IOT
VII	ET37P	Industrial IOT Lab

VLSID track: Courses to be chosen for specialization in Very Large-Scale Integration Design

Semester	Course Code	Course Name
V	ET38T	Digital System Design
V	ET38P	Digital System Design Lab
VI	ET39T	Advanced VLSI Design and Technology
VI	ET39P	Advanced VLSI Design and Technology Lab
VI	ET40T	Analog IC Design

VI	ET40P	Analog IC Design Lab
VII	ET41T	ASIC and Verification
VII	ET41P	ASIC and Verification Lab
VII	ET42T	System on Chip
VII	ET42P	System on Chip Lab
VII	ET43T	Mixed Signal VLSI
VII	ET43P	Mixed Signal VLSI Lab