Vidyalankar Institute of Technology

An Autonomous Institute affiliated to University of Mumbai

Master of Technology

in

Electronics & Telecommunication Engineering

Programme Structure

(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 Vidyalankar 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, problem-solving approach and research ability 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 courses learnt by learners, internships and dissertation is finalized considering the scope of study and the ability that a learner should gain through the programme.

The curriculum has core courses of engineering, specific to the branch. These courses are completed in first year of the engineering programme that enables learners to work on their chosen dissertation topic during their final year. The curriculum planned by the Institute offer flexibility and diversity to learners to choose any set of courses from a basket of professional electives. Learner can also choose to specialize in a domain as per their field of interest. The selection of unique specialization tracks based on recent developments and industrial requirements is a salient feature of this curricula ensuring employability. Each specialization track has mandatory courses positioned and sequenced to achieve sequential and integral learning for the required depth of the specific domain. Learner can choose to complete these courses in first year of the engineering program that enables him/her to prepare for research during their final year. Credits additional to core and professional elective courses, include dissertation, internships, advanced courses in the field of computer engineering, multi-disciplinary courses, special skill development courses and similar knowledge that make learner capable to do further research or work in industrial environment.

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   Chairman, Academic Council
Department of Ele. & Telecom. Engineering   Vidyalankar Institute of Technology
Vidyalankar Institute of Technology

CREDIT STRUCTURE

Learner is expected to complete requirement of 70 credits (with minimum credits under each category as mentioned below) for M. Tech. degree in Electronics & Telecommunication Engineering.

Sr. No.	Course Category	Credits / Audit
I	Core	16
II	Professional Elective	16
III	Open Elective	08
IV	Internship	04
V	Dissertation	26
Total		**70**

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

Guidelines for Specialization Certificate

Learner can avail a Specialization Certificate from the Institute stating "Successful completion of Masters of Technology in Computer Engineering with Specialization in ____<Track Name> " on successful completion of all Professional Elective courses of a chosen domain/ track.

Courses Under Various Categories

I. Core Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET71	Advanced Optical Communication Systems	3	2	-	4	1
2	ET72	Wireless Adhoc and Sensor Networks	3	2	-	4	1
3	ET73	Advanced Digital Signal Processing	3	2	-	4	2
4	ET74	Software Defined Radio	3	2	-	4	2

II. Professional Elective Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET75	OFDM and MIMO Technology	3	2	-	4	1
2	ET76	Smart Antennas System	3	2	-	4	1
3	ET77	Passive Optical Networks	3	2	-	4	2
4	ET78	Space-Time Wireless Communication	3	2	-	4	2
5	ET79	Embedded Communication Systems Design	3	2	-	4	1
6	ET80	Reconfigurable Computing and FPGAs	3	2	-	4	1
7	ET81	Smart Sensors and Internet of Things	3	2	-	4	2
8	ET82	High Performance Computing	3	2	-	4	2
9	ET83	Sensor Technology and MEMS, NEMS	3	2	-	4	1
10	ET84	Analog & Mixed Signal Circuit Design	3	2	-	4	1
11	ET85	VLSI Signal Processing	3	2	-	4	2
12	ET86	Integrated Circuits for Wireless Communication	3	2	-	4	2

III. Open Elective Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OE04	Sustainability Management	4	-	-	4	-
2	OE05	Operation Research	4	-	-	4	-
3	OE06	IPR and Patenting	4	-	-	4	-
4	OE07	Research Methodology	4	-	-	4	-
5	OE13*	Online Course 1 (MOOC)	As per course			2	-
6	OE14*	Online Course 2 (MOOC)	As per course			2	-

*Online Courses (MOOC) of 2 credits is equivalent to 30 hours course.

IV. Internship

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET87	Internship	-	8$	-	4	3
2	ET88	Skill Based Course 1	-	4#	-	2	3
3	ET89	Skill Based Course 1	-	4#	-	2	3

$: Internship of 4 credits is equivalent to 120 hours of contact.

#: Skill based Course of 2 credits is equivalent to 60 hours course.

V. Dissertation

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ET90	Dissertation-I	-	20	-	10	3
2	ET91	Dissertation-II	-	32	-	16	4

Mandatory Courses to be completed to avail Specialization Certificate are as stated below:

Course Structure and Assessment Guidelines

for

Master of Technology

in

Electronics & Telecommunication Engineering

First Year M. Tech. Electronics and Telecommunication Engineering   Semester: I
Course Structure and Assessment Guidelines

Course		Head of Learning	Credits	Assessment Guidelines (Marks)				Total marks (Passing@45% of total marks)
Code	Name			ISA	MSE	ESE	Lab Work	
ET71	Advanced Optical Communication Systems	Theory+ Practical	4	40	20	40	25	125
ET72	Wireless Adhoc and Sensor Networks	Theory+ Practical	4	40	20	40	25	125
ETXX	Professional Elective-1	Theory+ Practical	4	40	20	40	25	125
ETXX	Professional Elective-2	Theory+ Practical	4	40	20	40	25	125
OEXX*	Open Elective-1	As per course						

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
*Selection will be based on the subset of OE 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.

Refer Appendix-A for guidelines on Professional Elective Courses and Specialization Certificate

Professional Elective-1 Courses (ETXX)

Course Code	Course Name	Specialization Track Name#
ET75	OFDM and MIMO Technology	Communication
ET79	Embedded Communication Systems Design	Embedded and IoT
ET83	Sensor Technology and MEMS, NEMS	VLSI

#For details of Specialization Certificate, refer Appendix-A

Professional Elective-2 Courses (ETXX)

Course Code	Course Name	Specialization Track Name#
ET76	Smart Antennas System	Communication
ET80	Reconfigurable Computing and FPGAs	Embedded and IoT
ET84	Analog & Mixed Signal Circuit Design	VLSI

#For details of Specialization Certificate, refer Appendix-A

First Year M. Tech. Electronics and Telecommunication Engineering   **Semester: II**
Course Structure and Assessment Guidelines

Course		Head of Learning	Credits	Assessment Guidelines (Marks)				Total marks (Passing@45% of total marks)
Code	Name			ISA	MSE	ESE	Lab Work	
ET73	Advanced Digital Signal Processing	Theory+ Practical	4	40	20	40	25	125
ET74	Software Defined Radio	Theory+ Practical	4	40	20	40	25	125
ETXX	Professional Elective-3	Theory+ Practical	4	40	20	40	25	125
ETXX	Professional Elective-4	Theory+ Practical	4	40	20	40	25	125
OEXX*	Open Elective-2	As per course						

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
*Selection will be based on the subset of OE 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.

Professional Elective-3 Courses (ETXX)

Course Code	Course Name	Specialization Track Name#
ET77	Passive Optical Networks	Communication
ET81	Smart Sensors and Internet of Things	Embedded and IoT
ET85	VLSI Signal Processing	VLSI

#For details of Specialization Certificate, refer Appendix-A

Professional Elective-4 Courses (ETXX)

Course Code	Course Name	Specialization Track Name#
ET78	Space-Time Wireless Communication	Communication
ET82	High Performance Computing	Embedded and IoT
ET86	Integrated Circuits for Wireless Communication	VLSI

#For details of Specialization Certificate, refer Appendix-A

Second Year M. Tech. Electronics & Telecommunication Engineering   **Semester: III**
Course Structure and Assessment Guidelines

Course		Head of Learning	Credits	Assessment Guidelines (Marks)				Total marks (Passing@45% of total marks)
Code	Name			ISA	MSE	ESE	Lab Work	
CE86	Dissertation-I	Theory+ Practical	10	150	-	150	-	300
CEXX#	Internship/ 2 Skilled courses	Practical	4	50	-	50	-	100
OEXX*	Open Elective-3	As per course						

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
*Selection will be based on the subset of OE courses made available by the Institute for the semester.
#Guide can recommend 120 hours of Internship or 2 Skill based courses of 60 hours each, to enhance learner's ability to work on Dissertation topic.

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 M. Tech. Electronics & Telecommunication Engineering   **Semester: IV**
Course Structure and Assessment Guidelines

Course		Head of Learning	Credits	Assessment Guidelines (Marks)				Total marks (Passing@45% of total marks)
Code	Name			ISA	MSE	ESE	Lab Work	
CE87	Dissertation-II	Practical	16	200	-	200	-	400

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

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.

Appendix-A

Guidelines for Professional Elective Courses and Specialization Certificate

Professional Elective courses are designed to meet industrial requirements. All learners must opt for 4 professional elective courses as a part of requirement for M.Tech. degree.

Specialization Certificate is introduced in order to build competency of learners in the chosen domain. Department of Computer Engineering offers the following specialization tracks:

1. Communication
2. Embedded Systems and IoT
3. VLSI

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

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

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

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

Preferred Semester	Course Code	Course Name
I	ET75	OFDM and MIMO Technology
I	ET76	Smart Antennas System
II	ET77	Passive Optical Networks
II	ET78	Space-Time Wireless Communication

Embedded Systems and IoT track: Courses to be chosen for specialization in Embedded Systems and IoT

Preferred Semester	Course Code	Course Name
I	ET79	Embedded Communication Systems Design
I	ET80	Reconfigurable Computing and FPGAs
II	ET81	Smart Sensors and Internet of Things
II	ET82	High Performance Computing

VLSI track: Courses to be chosen for specialization in VLSI

Preferred Semester	Course Code	Course Name
I	ET83	Sensor Technology and MEMS, NEMS
I	ET84	Analog & Mixed Signal Circuit Design
II	ET85	VLSI Signal Processing
II	ET86	Integrated Circuits for Wireless Communication