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

Computer Engineering

Programme Structure

(As per NEP 2020, 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 mode 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 life long 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 course 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 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. aims 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 student capable of working on industry relevant problems.

Chairman, Board of Studies
Department of Computer Engineering
Vidyalankar Institute of Technology

Chairman, Academic Council
Vidyalankar Institute of Technology

VERTICAL BASED CREDIT ALLOTMENT

Sr. No.	Verticals	Baskets	Credits
I	BSC/ ESC	Basic Science (BS)	15
II		Engineering Science (ES)	12
III	Program Courses	Programme Core Course (PCC)	44
IV		Programme Elective Course (PEC)	18
V	Multidisciplinary Courses	Multidisciplinary Minor (MDM)	14
VI		Open Elective (OE)	08
VII	Skill Courses	Vocational and Skill Enhancement Course (VSEC)	08
VIII	Humanities Social Science and Management (HSSM)	Ability Enhancement Course (AEC)	04
IX		Entrepreneurship/ Economics/ Management Course (EEMC)	04
X		Indian Knowledge System (IKS)	02
XI		Value Education Course (VEC)	04
XII	Experiential Learning Courses	Research Methodology (RM)	03
XIII		Comm. Engg. Project (CEP)/ Field Project (FP)	03
XIV		Project	06
XV		Internship/ OJT	12
XVI	Liberal Learning Courses	Co-Curricular Courses (CC)	04
Total			**161**

Learner is expected to complete requirement of 161 credits (with minimum credits under each vertical and/or bucket as mentioned above) for B.Tech. degree in Computer Engineering with Multidisciplinary Minor.

Additionally, learners can choose to avail i) B.Tech. in Computer Engineering – Honors and Multidisciplinary Minor or ii) B.Tech. in Computer Engineering - Honours with Research and Multidisciplinary Minor or iii) B.Tech. in Computer Engineering with Double Minors (Multidisciplinary and Specialization Minor) Degree by completing requirements of 18 credits, which will be over and above the 161 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 Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	BS01	Engineering Mathematics-I	3	-	-	3	1
2	BS14T	Physics	2	-	-	2	2
3	BS14P	Physics Lab	-	2	-	1	2
4	BS03	Engineering Mathematics-II	3	-	-	3	2
5	BS41	Engineering Mathematics-III	3	-	-	3	3
6	BS42	Engineering Mathematics-IV	3	-	-	3	4

II. Engineering Science Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ES06T	Fundamentals of Computer Hardware and Networking	2	-	-	2	1
2	ES06P	Fundamentals of Computer Hardware and Networking Lab	-	2	-	1	1
3	ES07T	Fundamentals of Logic Circuits	2	-	-	2	1
4	ES07P	Fundamentals of Logic Circuits Lab	-	2	-	1	1
5	ES01T	Engineering Graphics	2	-	-	2	1
6	ES01P	Engineering Graphics Lab	-	2	-	1	1
7	ES10	Computer Organization and Architecture	3	-	-	3	2

III. Programme Core Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	CE01T	Data Structure	2	-	-	2	2
2	CE01P	Data Structure Lab	-	2	-	1	2
3	CE02T	Microprocessor	2	-	-	2	3
4	CE02P	Microprocessor Lab	-	2	-	1	3
5	CE04T	Analysis of Algorithms	2	-	-	2	3
6	CE04P	Analysis of Algorithms Lab	-	2	-	1	3

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
7	CE05T	Database Management Systems	2	-	-	2	3
8	CE05P	Database Management Systems Lab	-	2	-	1	3
9	CE06T	Computer Graphics	2	-	-	2	4
10	CE06P	Computer Graphics Lab	-	2	-	1	4
11	CE07T	Operating Systems	2	-	-	2	4
12	CE07P	Operating Systems Lab	-	2	-	1	4
13	CE09	Theory of Computational Science	2	-	1	3	4
14	CE11T	Computer Networks	2	-	-	2	4
15	CE11P	Computer Networks Lab	-	2	-	1	4

IV. Multidisciplinary Minor Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	BS17	Biology	2	-	-	2	3
2	BS19	Chemistry	2	-	-	2	3
3	GESB07	Psychology	2	-	-	2	Any
4	GENS02	Modern Farming	2	-	-	2	Any

V. Vocational and Skill Enhancement Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ES04T	Structured Programming	2	-	-	2	1
2	ES04P	Structured Programming Lab	-	2	-	1	1
3	ES05T	Object Oriented Programming	2	-	-	2	2
4	ES05P	Object Oriented Programming Lab	-	2	-	1	2
5	ES11	Python Programming	-	4	-	2	4

VI. Ability Enhancement Courses

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

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
3	HS03	Technical and Business Writing	1	2	-	2	Any
4	HS04	Presentation Skills	-	2	-	1	Any
5	GEA01	Voice Culture for Professional Speaking	2	-	-	2	Any
6	GESB04	Corporate and Social Etiquettes	2	-	-	2	Any

VII. Entrepreneurship/ Economics/ Management Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	HS06	Principles of Economics and Management	2	-	1	3	Any
2	GECI01	Design Thinking	2	-	1	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

VIII. Indian Knowledge System Courses

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

IX. Value Education Courses

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
6	GEPS02	Four Pillars of Democratic Nation	2	-	-	2	Any

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

X. Community Engagement Project/ Field Project

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	GESB01#	Social Service Internship/ Project	-	2	-	3	3

 # 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).

XI. Liberal Learning/ Co-curricular Courses

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

Illustrative Semester wise

Credit Distribution Structure and Assessment Guidelines

(Based on NEP 2020 Guidelines)

for

Bachelor of Technology

in

Computer Engineering-One Major, One Minor

Semester		1	2	3	4	5	6	7	8	Total Credits
Sub-Category	Vertical									
Basic Science Course	BSC/ ESC	6	3	3	3					15
Engineering Science		6	6							12
Programme Core Course (PCC)	Program Courses (PC)		3	9	12	12	6	2		44
Programme Elective Course (PEC)						3	6	9		18
Multidisciplinary Minor (MDM)	Multidisciplinary Courses (MDC)			2		3	3	3	3	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)						2			14
Entrepreneurship/ Economics/ Management Courses (EEMC)		3	3	3	3					
Indian Knowledge System (IKS)										
Value Education Courses (VEC)										
Research Methodology (RM)	Experiential Learning Courses (ELC)								3	3
Comm. Engg. Project (CEP)/ Field Project (FP)				3						3
Project								6		6
Internship/ OJT						2	3		7	12
Co-curricular Courses (CC)	Liberal Learning Courses (LLC)	2	2							4
Total Credits		20	20	20	20	20	20	20	21	161

First Year B. Tech. Computer Engineering **Preferred Semester: I**

Course Structure and Assessment Guidelines

NEP-Vertical	Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
	Code	Name			ISA	MSE	ESE	
BSC	BS01	Engineering Mathematics-I	Theory	3	20	30	50	100
ESC	ES01T	Engineering Graphics	Theory	2	15	20	40	075
ESC	ES01P	Engineering Graphics Lab	Practical	1	25	-	25	050
ESC	ES06T	Fundamentals of Computer Hardware and Networking	Theory	2	15	20	40	075
ESC	ES06P	Fundamentals of Computer Hardware and Networking Lab	Lab	1	25	-	25	050
ESC	ES07T	Fundamental of Logic Circuits	Theory	2	15	20	40	075
ESC	ES07P	Fundamental of Logic Circuits Lab	Lab	1	25	-	25	050
SC_VSEC	ES04T	Structured Programming	Theory	2	15	20	40	075
SC_VSEC	ES04P	Structured Programming Lab	Lab	1	25	-	25	050
HSSM_AEC	HS01T	Effective Communication	Theory	2	15	20	40	075
HSSM_AEC	HS01P	Effective Communication Lab	Practical	1	25	-	25	050
LLC_CC	GEXX*	Any LLC_CC course from the list	Theory	2	25	-	50	075
Total Credits				**20**				

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.

First Year B. Tech. Computer Engineering **Preferred Semester: II**

Course Structure and Assessment Guidelines

NEP-Vertical	Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40 % of total marks)
	Code	Name			ISA	MSE	ESE	
BSC	BS03	Engineering Mathematics-II	Theory	3	20	30	50	100
BSC	BS14T	Physics	Theory	2	15	20	40	075
BSC	BS14P	Physics Lab	Lab	1	25	-	25	050
ESC	ES10	Computer Organization and Architecture	Theory	3	20	30	50	100
PC_PCC	CE01T	Data Structure	Theory	2	15	20	40	075
PC_PCC	CE01P	Data Structure Lab	Practical	1	25	-	25	050
SC_VSEC	ES05T	Object-Oriented Programming	Theory	2	15	20	40	075
SC_VSEC	ES05P	Object-Oriented Programming Lab	Lab	1	25	-	25	050
HSSM_EEMC	GECI01	Design Thinking	Theory +Tutorial	3	50	-	50	100
LLC_CC	GEXX*	Any LLC_CC course from the list	Theory	2	25	-	50	075
Total Credits				**20**				

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

*Selection based on the subset of GE 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. Computer Engineering **Preferred Semester: III**

Course Structure and Assessment Guidelines

NEP-Vertical	Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
	Code	Name			ISA	MSE	ESE	
BSC	BS41	Engineering Mathematics-III	Theory	3	20	30	50	100
PC_PCC	CE02T	Microprocessor	Theory	2	15	20	40	075
PC_PCC	CE02P	Microprocessor Lab	Practical	1	25	-	25	050
PC_PCC	CE04T	Analysis of Algorithms	Theory	2	15	20	40	075
PC_PCC	CE04P	Analysis of Algorithms Lab	Practical	1	25	-	25	050
PC_PCC	CE05T	Database Management Systems	Theory	2	15	20	40	075
PC_PCC	CE05P	Database Management Systems Lab	Practical	1	25	-	25	050
CEP/FP	GESB01	Social Service Internship/ Project	Practical	3	25	-	50	075
MDM	XX*	Multidisciplinary Elective 1	Theory	2	As per course			
HSSM_AEC	HS04	Presentation Skills	Practical	1	50	-	-	050
HSSM_IKS	GEXXX*	Any HSSM_IKS course	Theory	2	25	-	50	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.

Second Year B. Tech. Computer Engineering **Preferred Semester: IV**

Course Structure and Assessment Guidelines

NEP-Vertical	Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
	Code	Name			ISA	MSE	ESE	
BSC	BS42	Engineering Mathematics-IV	Theory	3	20	30	50	100
PC_PCC	CE06T	Computer Graphics	Theory	2	15	20	40	075
PC_PCC	CE06P	Computer Graphics Lab	Practical	1	25	-	25	050
PC_PCC	CE07T	Operating Systems	Theory	2	15	20	40	075
PC_PCC	CE07P	Operating Systems Lab	Practical	1	25	-	25	050
PC_PCC	CE09	Theory of Computer Science	Theory+ Tutorial	3	40	20	40	100
PC_PCC	CE11T	Computer Networks	Theory	2	15	20	40	075
PC_PCC	CE11P	Computer Networks Lab	Practical	1	25	-	25	050
SC_VSEC	ES11	Python Programming	Practical	2	50	-	25	075
HSSM_VEC	GEXX/ HSXX*	Any HSSM_VEC course	Theory	3	As per course			
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.