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

Information Technology

with Multidisciplinary Minor

Programme Structure (R-2023)

(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 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 Programme Electives 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 Programme Electives 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 Information Technology
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)	20
V	Multidisciplinary Courses	Multidisciplinary Minor (MDM)	14
VI		Open Elective (OE)	09
VII	Skill Courses	Vocational and Skill Enhancement Course (VSEC)	08
VIII	Humanities Social Science and Management (HSSM)	Ability Enhancement Course (AEC)	14
IX		Entrepreneurship/ Economics/ Management Course (EEMC)	
X		Indian Knowledge System (IKS)	
XI		Value Education Course (VEC)	
XII	Experiential Learning Courses	Research Methodology (RM)	03
XIII		Comm. Engg. Project (CEP)/ Field Project (FP)	02
XIV		Project	07
XV		Internship/ OJT	12
XVI	Liberal Learning Courses	Co-Curricular Courses (CC)	04
Total			**164**

Learner is expected to complete requirement of 162 credits (with minimum credits under each vertical and/or bucket as mentioned above) for B.Tech. degree in Information Technology with Multidisciplinary Minor.

Additionally, learners can choose to avail i) B.Tech. in Information Technology – Honors and Multidisciplinary Minor or ii) B.Tech. in Information Technology - Honours with Research and Multidisciplinary Minor or iii) B.Tech. in Information Technology 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 (BSC)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	BSC01*	Engineering Mathematics-I	3	-	-	3	1
2	BSC02*	Engineering Mathematics-II	3	-	-	3	2
3	BSC03	Engineering Mathematics-III	3	-	-	3	3
4	BSC07	Engineering Mathematics-IV	3	-	-	3	4
5	BSC09T*	Physics	2	-	-	2	1
6	BSC09P*	Physics Lab	-	2	-	1	1

*** 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 (ESC)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ESC01T*	Engineering Graphics	2	-	-	2	2
2	ESC01P*	Engineering Graphics Lab	-	2	-	1	2
3	ESC04T*	Fundamentals of Computer Hardware and Networking	2	-	-	2	1
4	ESC04P*	Fundamentals of Computer Hardware and Networking Lab	-	2	-	1	1
5	ESC05T*	Fundamentals of Logic Circuits	2	-	-	2	1
6	ESC05P*	Fundamentals of Logic Circuits Lab	-	2	-	1	1
7	ESC08*	Computer Organization and Architecture	3	-	-	3	2

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

iii. Programme Core Courses (PCC)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PCIT01T	Data Structure & Analysis	2	-	-	2	3
2	PCIT01P	Data Structure & Analysis Lab	-	2	-	1	3
3	PCIT02T	Advanced Java	2	-	-	2	3
4	PCIT02P	Advanced Java Lab	-	2	-	1	3
5	PCIT03T	Computer Graphics	2	-	-	2	5
6	PCIT03P	Computer Graphics Lab	-	2	-	1	5
7	PCIT04T	Microprocessor	2	-	-	2	3
8	PCIT04P	Microprocessor Lab	-	2	-	1	3
9	PCIT05T	Operating Systems	2	-	-	2	4
10	PCIT05P	Operating Systems Lab	-	2	-	1	4
11	PCIT06T	Computer Networks	2	-	-	2	4
12	PCIT06P	Computer Networks Lab	-	2	-	1	4
13	PCIT07T	Database Management Systems	2	-	-	2	4
14	PCIT07P	Database Management Systems Lab	-	2	-	1	4
15	PCIT09	Automata Theory	2	-	1	3	4
16	PCIT10T	Data warehousing & Mining	2	-	-	2	5
17	PCIT10P	Data warehousing & Mining Lab	-	2	-	1	5
18	PCIT12T	Software Engineering with WDL	2	-	-	2	5
19	PCIT12P	Software Engineering with WDL Lab	-	2	-	1	5
20	PCIT13T	Cloud Computing	2	-	-	2	6
21	PCIT13P	Cloud Computing Lab	-	2	-	1	6
22	PCIT14T	Software Testing & Quality Assurance	2	-	-	2	7
23	PCIT14P	Software Testing & Quality Assurance Lab	-	2	-	1	7
24	PCIT15T	Machine Learning	2	-	-	2	5

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
25	PCIT15P	Machine Learning Lab	-	2	-	1	5
26	PCIT16P	DevOps Lab	-	4	-	2	6
27	PCIT30T	Mobile Communication & Computing	2	-	-	2	7
28	PCIT30P	Mobile Communication & Computing Lab	-	2	-	1	7

iv. Programme Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PEIT21T	Artificial Intelligence	2	-	-	2	5
2	PEIT21P	Artificial Intelligence Lab	-	2	-	1	5
3	PEIT22T	Advanced Database System	2	-	-	2	5
4	PEIT22P	Advanced Database System Lab	-	2	-	1	5
5	PEIT23T	Modern Sensors for IoT	2	-	-	2	5
6	PEIT23P	Modern Sensors for IoT Lab	-	2	-	1	5
7	PEIT24T	Computer & Network Security	2	-	-	2	5
8	PEIT24P	Computer & Network Security Lab	-	2	-	1	5
9	PEIT25T	Soft Computing	2	-	-	2	6
10	PEIT25P	Soft Computing Lab	-	2	-	1	6
11	PEIT26T	Data & Feature Engineering	2	-	-	2	6
12	PEIT26P	Data & Feature Engineering Lab	-	2	-	1	6
13	PEIT27T	Principles of IoT	2	-	-	2	6
14	PEIT27P	Principles of IoT Lab	-	2	-	1	6
15	PEIT28T	System Security & Ethical Hacking	2	-	-	2	6
16	PEIT28P	System Security & Ethical Hacking Lab	-	2	-	1	6
17	PEIT29T	Probabilistic Graphical Model	2	-	-	2	7
18	PEIT29P	Probabilistic Graphical Model Lab	-	2	-	1	7

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
19	PEIT31T	Embedded System Design with Tiny OS	2	-	-	2	7
20	PEIT31P	Embedded System Design with Tiny OS Lab	-	2	-	1	7
21	PEIT32T	Digital Forensic	2	-	-	2	7
22	PEIT32P	Digital Forensic Lab	-	2	-	1	7
23	PEIT33T	Data Analytics & Visualization	2	-	-	2	7
24	PEIT33P	Data Analytics & Visualization Lab	-	2	-	1	7
25	PEIT34T	Big Data Analytics	2	-	-	2	7
26	PEIT34P	Big Data Analytics Lab	-	2	-	1	7
27	PEIT35T	IoT Network & Protocols & Edge Computing	2	-	-	2	7
28	PEIT35P	IoT Network & Protocols & Edge Computing Lab	-	2	-	1	7
29	PEIT36T	Mobile and Wireless Security	2	-	-	2	7
30	PEIT36P	Mobile and Wireless Security Lab	-	2	-	1	7
31	PEIT37T	Deep Learning	2	-	-	2	7
32	PEIT37P	Deep Learning Lab	-	2	-	1	7
33	PEIT38T	Recommendation System	2	-	-	2	7
34	PEIT38P	Recommendation System Lab	-	2	-	1	7
35	PEIT39T	IoT Security & Trust	2	-	-	2	7
36	PEIT39P	IoT Security & Trust Lab	-	2	-	1	7
37	PEIT40T	Malware Analysis	2	-	-	2	7
38	PEIT40P	Malware Analysis Lab	-	2	-	1	7
39	PEIT41T	Natural Language Processing	2	-	-	2	8
40	PEIT41P	Natural Language Processing Lab	-	2	-	1	8
41	PEIT42T	Text, Web &Social Media Analytics	2	-	-	2	8
42	PEIT42P	Text, Web & Social Media Analytics Lab	-	2	-	1	8
43	PEIT43T	Industrial IoT	2	-	-	2	8
44	PEIT43P	Industrial IoT Lab	-	2	-	1	8

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
45	PEIT44T	Web Application Security	2	-	-	2	8
46	PEIT44P	Web Application Security Lab	-	2	-	1	8

v. Multidisciplinary Minor Courses

Sr. No.	Title of MDM	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
				Theory	Practical	Tutorial		
1		MDM01	Seminar	2	-	-	2	8
2	Bioinformatics	MDMBI01	Introduction to Bioinformatics	3	-	1	4	5
		MDMBI02	Algorithms and Data Structures in Bioinformatics	3	-	1	4	6
		MDMBI03	Machine Learning Applications in Bioinformatics	3	-	1	4	7
3	Innovation, Entrepreneurial and Venture Development	MDMIE01	Foundations of Innovation and Entrepreneurship	3	-	1	4	5
		MDMIE02	Startup Planning and Development	3	-	1	4	6
		MDMIE03	Innovation Management and Scaling Startups	3	-	1	4	7
4	Business Development, Marketing and Finance	MDMBD01	Introduction to Business Development and Marketing Principles	3	-	1	4	5
		MDMBD02	Financial Basics for Engineers and Technopreneurs	3	-	1	4	6
		MDMBD03	Strategic Marketing and Business Planning	3	-	1	4	7

Sr. No.	Title of MDM	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
				Theory	Practical	Tutorial		
5	Robotics	MDMRB01	Fundamentals of Robotics and Control	3	2		4	5
		MDMRB02	Machine Vision and Robotic Perception	3	2		4	6
		MDMRB03	Intelligent Mobile Robotics	3	2		4	7

vi. Open Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OEC01*	Collaborative Inter-Institute Studies	4	-	-	4	Sem 4 summer break
2	OEC02	Cyber Law	2	-	-	2	Any
3	OEC03	Project Management	2	-	-	2	Any
4	OEC04	Product Lifecycle Management	2	-	-	2	Any
5	OEC05	Sustainability Management	2	-	-	2	Any
6	OEC06	Renewable Energy Management	2	-	-	2	Any
7	OEC07	Biology	2	-	-	2	3
8	OEC08	Chemistry	2	-	-	2	3
9	OEC11	Psychology	2	-	1	3	4
10	OEC13	Principle of Communications	2	-	-	2	3

* **For OEC01- Collaborative Inter-Institute Studies:** 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).
NOTE: As per Institute guidelines, the results of courses completed in inter-semester break will appear in the marksheet of the next semester.

vii. Vocational and Skill Enhancement Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	VSEC01T	Structured Programming	2	-	-	2	1
2	VSEC01P	Structured Programming Lab	-	2	-	1	1
3	VSEC02T	Object Oriented Programming	2	-	-	2	2
4	VSEC02P	Object Oriented Programming Lab	-	2	-	1	2
5	VSEC03	Python Programming	-	4	-	2	4

viii. Ability Enhancement Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	AEC01T	Effective Communication	2	-	-	2	Any
2	AEC01P	Effective Communication Lab	-	2	-	1	Any
3	AEC02	Technical and Business Writing	1	2	-	2	Any
4	AEC03	Presentation Skills	-	2	-	1	Any
5	AEC04	Voice Culture for Professional Speaking	-	2	-	1	Any

ix. Entrepreneurship/ Economics/ Management Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	EEMC02	Principles of Economics and Management	2	-	1	3	Any
2	EEMC01	Design Thinking	3	-	-	3	Any
3	EEMC03	Engineering Economics	2	-	-	2	Any

x. Indian Knowledge System Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	IKS01	Indian Traditional Knowledge System	2	-	-	2	Any
2	IKS02	Indian Constitution	2	-	-	2	Any
3	IKS03	Exploring Indian Art	2	-	-	2	Any

xi. Value Education Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	VEC01T	Professional Skills	2	-	-	2	Any
2	VEC01P	Professional Skills Lab	-	2	-	1	Any
3	VEC02	E-waste and Environmental Management	2	2	-	2	Any
4	VEC03	Universal Human Values	2	-	-	2	Any
5	VEC04	Responsibility towards sustainable environment	2	-	-	2	Any
6	VEC05	Four Pillars of Democratic Nation	2	-	-	2	Any

xii. Research Methodology Courses

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	RM01	Research Methodology	3	-	-	3	7 or 8

xiii. Community Engagement Project/ Field Project

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
	CEP01*	Social Service Internship/ Project	-	4	-	2	3

* **For CEP01- Social Service Internship/ Project:** 1 hour / week slot will be provided during the semester (in regular timetable). Additional work of 45 hours needs to be completed during the semester (besides regular timetable) or after the semester (during inter semester break).

NOTE: As per Institute guidelines, the results of courses completed in inter-semester break will appear in the marksheet of the next semester.

xiv. Project

Sr. No	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PRJIT01	Mini-Project	-	4	-	2	4
2	PRJIT02	Project-1 (Synopsis)	1	-	-	1	6
3	PRJIT03	Project-2 (Final)	-	8	-	4	7
4	PRJIT05	Specialization-Based Project	-	4	-	2	6

xv. Internship/ On Job Training (OJT)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OJT01	Industry Internship 1	-	150 hrs (Total)	-	5	4
2	OJT02	Industry Internship 2	-	210 hrs (Total)	-	7	5

xvi. Liberal Learning/ Co-curricular Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1.	CC01	Various Dance Forms	2	-	-	2	Any
2.	CC02	Corporate and Social Etiquettes	2	-	-	2	Any
3.	CC03	Global Citizenship Education	2	-	-	2	Any
4.	CC04	Wellness – Body, Mind & Spirit	2	-	-	2	Any
5.	CC05	IQ vs EQ	2	-	-	2	Any
6.	CC06	Nutrition and Physical Wellness	2	-	-	2	Any
7.	CC07	Facets of Astronomy	2	-	-	2	Any
8.	CC08	Railways - Wonders of Infrastructure	2	-	-	2	Any
9.	CC09	Financial Literacy for Engineers	2	-	-	2	Any
10.	CC10	Mastering Advanced Excel	2	-	-	2	Any
11.	CC11	Personal Grooming Essentials	2	-	-	2	Any
12.	CC12	Various Music Forms	2	-	-	2	Any

Illustrative Semester wise

Credit Distribution Structure and Assessment Guidelines

(Based on NEP 2020 Guidelines)

for

Bachelor of Technology

in

Information Technology with Multidisciplinary Minor

First Year B. Tech. Information Technology **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	BSC01	Engineering Mathematics-I	Theory	3	20	30	50	100
	BSC09T	Physics	Theory	2	15	20	40	075
	BSC09P	Physics Lab	Practical	1	25	-	25	050
ESC	ESC04T	Fundamentals of Computer Hardware and Networking	Theory	2	15	20	40	075
	ESC04P	Fundamentals of Computer Hardware and Networking Lab	Practical	1	25	-	25	050
	ESC05T	Fundamental of Logic Circuits	Theory	2	15	20	40	075
	ESC05P	Fundamental of Logic Circuits Lab	Practical	1	25	-	25	050
SC_VSEC	VSEC01T	Structured Programming	Theory	2	15	20	40	075
	VSEC01P	Structured Programming Lab	Practical	1	25	-	25	050
HSSM_AEC	AEC01T	Effective Communication	Theory	2	15	20	40	075
	AEC01P	Effective Communication Lab	Practical	1	25	-	25	050
LLC_CC	CCXX*	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 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. Information Technology **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	BSC03	Engineering Mathematics-II	Theory	3	20	30	50	100
ESC	ESC01T	Engineering Graphics	Theory	2	15	20	40	075
	ESC01P	Engineering Graphics Lab	Practical	1	25	-	25	050
	ESC08	Computer Organization and Architecture	Theory	3	20	30	50	100
SC_VSEC	VSEC02T	Object-Oriented Programming	Theory	2	15	20	40	075
	VSEC02P	Object-Oriented Programming Lab	Practical	1	25	-	25	050
HSSM_EEMC	EEMC01	Design Thinking	Theory + Practical	3	-	-	125	125
LLC_CC	CCXX	Any LLC_CC course	Theory	2	25	-	50	075
HSSM_VEC	VEC01T	Professional Skills	Theory	2	15	20	40	075
	VEC01P	Professional Skills Lab	Practical	1	25	-	25	050
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. Information Technology **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	BSC05	Engineering Mathematics-III	Theory	3	20	30	50	100
PC_PCC	PCIT17T	Microprocessor	Theory	2	15	20	40	075
	PCIT17P	Microprocessor Lab	Practical	1	25	-	25	050
	PCIT02T	Advanced Java	Theory	2	15	20	40	075
	PCIT02P	Advanced Java Lab	Practical	1	25	-	25	050
	PCIT01T	Data Structure & Analysis	Theory	2	15	20	40	075
	PCIT01P	Data Structure & Analysis Lab	Practical	1	25	-	25	050
CEP	CEP01	Social Service Internship/ Project	Practical	2	25	-	50	075
OEC	OECXX	Any OE Course	Theory	2	15	20	40	075
HSSM_AEC	AEC03	Presentation Skills	Practical	1	50	-	-	050
HSSM_IKS	GEXX*	Any HSSM_IKS course	Theory	2	25	-	50	075
Total Credits				**19**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
*Selection of any one course 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.

List of Open Elective Courses (OECXX)

Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
Code	Name			ISA	MSE	ESE	
OEC02	Cyber Law	Theory	2	15	20	40	075
OEC03	Project Management	Theory	2	15	20	40	075
OEC04	Product Lifecycle Management	Theory	2	15	20	40	075
OEC05	Sustainability Management	Theory	2	15	20	40	075
OEC06	Renewable Energy Management	Theory	2	15	20	40	075
OEC07	Biology	Theory	2	15	20	40	075
OEC08	Chemistry	Theory	2	15	20	40	075
OEC13	Principles of Communication	Theory	2	15	20	40	075

Second Year B. Tech. Information Technology **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	BSC07	Engineering Mathematics-IV	Theory	3	20	30	50	100
PC_PCC	PCIT05T	Operating Systems	Theory	2	15	20	40	075
	PCIT05P	Operating Systems Lab	Practical	1	25	-	25	050
	PCIT06T	Computer Networks	Theory	2	15	20	40	075
	PCIT06P	Computer Networks Lab	Practical	1	25	-	25	050
	PCIT09	Automata Theory	Theory+ Tutorial	3	40	20	40	100
	PCIT07T	Database Management Systems	Theory	2	15	20	40	075
	PCIT07P	Database Management Systems Lab	Practical	1	25	-	25	050
VSEC03	VSEC03	Skill based Lab – Python	Practical	2	50	-	25	075
Project	PRJCE01	Mini-Project	Practical	2	25	-	50	075
OEC	OEC11	Psychology	Theory+ Tutorial	3	100	-	-	100
Total Credits				**22**				

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. Information Technology - Summer Break

 # 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).

Third Year B. Tech. Information Technology **Preferred Semester: V**

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	
PC_PCC	PCIT10T	Data warehousing & Mining	Theory	2	15	20	40	075
	PCIT10P	Data warehousing & Mining Lab	Practical	1	25	-	25	050
	PCIT15T	Machine Learning	Theory	2	15	20	40	075
	PCIT15P	Machine Learning Lab	Practical	1	25	-	25	050
	PCIT12T	Software Engineering with WDL	Theory	2	15	20	40	075
	PCIT12P	Software Engineering with WDL Lab	Practical	1	25	-	25	050
	PCIT03T	Computer Graphics	Theory	2	15	20	40	075
	PCIT03P	Computer Graphics Lab	Practical	1	25	-	25	050
PC_PEC	PEITXXT	Programme Electives-1	Theory	2	15	20	40	075
	PEITXXT	Programme Electives-1 Lab	Practical	1	25	-	25	050
MDM	MDMXX	As per MDM course list	Theory+ Tutorial	4	45	30	50	125
HSSM_VEC	VEC02	E-waste and Environmental Management	Theory	2	15	20	40	075
Total Credits				**21**				
Course credits completed during the previous inter-semester break will appear in this semester's marksheet								

MDC_OEC	OEC01	Collaborative Inter-Institute Studies	As per course	4	125	-	-	125

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.

Guidelines for Multidisciplinary Elective Courses and Minor Degree – Refer Appendix-B

Learners are required to go through the Appendix-B carefully before selecting the Multidisciplinary Elective courses. Detailed guidelines regarding Multidisciplinary Elective courses, Minor Degree Titles and courses relevant to each MD M Title are given in Appendix-B.

Guidelines for Programme Electives Courses and Specialization Certificate – Refer Appendix-A

Important Note 1: Learners are required to go through the Appendix-A carefully before selecting the Programme Electives courses. Detailed guidelines regarding Programme Electives courses, specialization tracks and courses relevant to each track are given in Appendix-A.

#For details of Specialization Certificate, refer Appendix-A

Programme Electives-1 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
PEIT21T	Artificial Intelligence	Artificial Intelligence & Machine Learning (AIML)
PEIT21P	Artificial Intelligence Lab	
PEIT22T	Advanced Database Management System	Data Science
PEIT22P	Advanced Database Management System Lab	
PEIT23T	Modern Sensors for IoT	IoT
PEIT23P	Modern Sensors for IoT Lab	
PEIT24T	Computer and Network Security	Cyber Security (CSec)
PEIT24P	Computer and Network Security Lab	

#For details of Specialization Certificate, refer Appendix-A

Third Year B. Tech. Information Technology **Preferred Semester: VI**

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	
PC_PCC	PCIT13T	Cloud Computing	Theory	2	15	20	40	075
	PCIT13P	Cloud Computing Lab	Practical	1	25	-	25	050
	PCIT14T	Software Testing & Quality Assurance	Theory	2	15	20	40	075
	PCIT14P	Software Testing & Quality Assurance Lab	Practical	1	25	-	25	050
	PCIT16P	DevOps Lab	Practical	2	50	-	25	075
PC_PEC	PEITXXT	Programme Electives-2	Theory	2	15	20	40	075
	PEITXXT	Programme Electives-2 Lab	Practical	1	25	-	25	050
	PEITXXT	Programme Electives-3	Theory	2	15	20	40	075
	PEITXXT	Programme Electives-3 Lab	Practical	1	25	-	25	050
	PRJIT05	Specialization-Based Project	Practical	2	25	-	50	075
Project	PRJIT02	Project-1 (Synopsis)	Theory	1	25		25	050
MDM	MDMXX	As per MDM course list	Theory+ Tutorial	4	45	30	50	125
Total Credits				**21**				

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.

Programme Electives-2 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
PEIT25T	Soft Computing	Artificial Intelligence & Machine Learning (AIML)
PEIT25P	Soft Computing Lab	
PEIT26T	Data & Feature Engineering	Data Science
PEIT26P	Data & Feature Engineering Lab	
PEIT27T	Principles of IOT	IoT
PEIT27P	Principles of IOT Lab	
PEIT28T	System Security and Ethical Hacking	Cyber Security (CSec)
PEIT28P	System Security and Ethical Hacking Lab	

#For details of Specialization Certificate, refer Appendix-A

Programme Electives-3 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
PEIT29T	Probabilistic Graphical Model	Artificial Intelligence & Machine Learning (AIML)
PEIT29P	Probabilistic Graphical Model Lab	
PEIT29T	Probabilistic Graphical Model	Data Science
PEIT29P	Probabilistic Graphical Model Lab	
PEIT31T	Embedded System Design with tiny OS	IoT
PEIT31P	Embedded System Design with tiny OS Lab	
PEIT32T	Digital Forensics	Cyber Security (CSec)
PEIT32P	Digital Forensics Lab	

#For details of Specialization Certificate, refer Appendix-A

Third Year B. Tech. Information Technology - Summer Break

Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
Code	Name			ISA	MSE	ESE	
OJT01	Industry Internship 1	Internship	5	75	-	75	150
Total Credits			**05**				

*150+ hours of industry internship to be done during inter semester break between semester 6 and semester 7.

NOTE: As per Institute guidelines, the results of courses completed in inter-semester break will appear in the marksheet of the next semester.

Final Year B. Tech. Information Technology **Preferred Semester: VII**

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	
PC_PCC	PCIT30T	Mobile Communication & Computing	Theory	2	15	20	40	075
	PCIT30P	Mobile Communication & Computing Lab	Practical	1	25	-	25	050
PC_PEC	PEITXXT	Programme Electives-4	Theory	2	15	20	40	075
	PEITXXT	Programme Electives-4 Lab	Practical	1	25	-	25	050
	PEITXXT	Programme Electives-5	Theory	2	15	20	40	075
	PEITXXT	Programme Electives-5 Lab	Practical	1	25	-	25	050
	PEITXXT	Programme Electives-6	Theory	2	15	20	40	075
	PEITXXT	Programme Electives-6 Lab	Practical	1	25	-	25	050
Project	PRJIT03	Project-2 (Final)	Practical	4	75	-	50	125
MDM	MDMXXX	Any MDM course	Theory+ Tutorial	4	45	30	50	125
MDM	MDM01	Seminar	Theory	2	25	-	50	075
Total Credits				**20**				
Course credits completed during the previous inter-semester break will appear in this semester's marksheet								
ELC_OJT	OJT01	Industry Internship 1	Internship	5	75	-	75	150

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
*Selection is based on subset of OE courses offered 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.

Programme Electives-4 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
PEIT33T	Data Analytics & Visualization	Artificial Intelligence and Machine Learning (AIML)
PEIT33P	Data Analytics & Visualization Lab	
PEIT34T	Big Data Analytics	Data science (DS)
PEIT34P	Big Data Analytics Lab	
PEIT35T	IoT and Edge Computing	Internet of Things (IoT)
PEIT35P	IoT and Edge Computing Lab	
PEIT36T	Mobile and Wireless Security	Computer Security (CSec)
PEIT36P	Mobile and Wireless Security Lab	

#For details of Specialization Certificate, refer Appendix-A

Programme Electives-5 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
PEIT37T	Deep Learning	Artificial Intelligence and Machine Learning (AIML)
PEIT37P	Deep Learning Lab	
PEIT38T	Recommendation Systems	Data science (DS)
PEIT38P	Recommendation Systems Lab	
PEIT39T	IoT Security and Trust	Internet of Things (IoT)
PEIT39P	IoT Security and Trust Lab	
PEIT40T	Malware Analysis	Cyber Security (CSec)
PEIT40P	Malware Analysis Lab	

#For details of Specialization Certificate, refer Appendix-A

Programme Electives-6 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
PEIT41T	Natural language processing	Artificial Intelligence and Machine Learning (AIML)
PEIT41P	Natural language processing Lab	
PEIT42T	Text, Web & Social Media Analytics	Data science (DS)
PEIT42P	Text, Web & Social Media Analytic Lab	
PEIT43T	Industrial IOT	Internet of Things (IoT)
PEIT43P	Industrial IOT Lab	
PEIT44T	Web Application Security	Computer Security (CSec)
PEIT44T	Web Application Security Lab	

#For details of Specialization Certificate, refer Appendix-A

Guidelines for Award of Honours/ Honours by Research / Double Minor (Multidisciplinary and Specialization) Degree

Before the end of Semester 5, learners are required to go through the Honours/ Honours by Research/ Specialization Minor Degree Programme document carefully to opt for Honours/ Honours by Research/ Double Minor Degree. Learners willing to opt for Honours/ Honours by Research/ Specialization Minor degree programme are required to satisfy the eligibility criteria stated in the document.

Final Year B. Tech. Information Technology **Preferred Semester: VIII**

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	
ELC_OJT	OJT02	Industry Internship 2	Practical	7	100	-	100	200
ELC_RM	RM01	Research Methodology	Theory	3	20	30	50	100
MDM	MDM01	Seminar	Theory	2	25	-	50	075
Total Credits				**12**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
*Selection is based on subset of courses offered 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.

Appendix-A

Guidelines for Programme Electives Courses and Specialization Certificate

Programme Electives courses are designed to meet industrial requirements. All learners must opt for 5 Programme Electives courses (both Theory and Practical Components) as a part of minimum requirement for B.Tech. degree.

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

1. Artificial Intelligence and Machine Learning (AIML)
2. Data science (DS)
3. Cyber Security
4. IoT (CSL)

From semester 5 to semester 8, learners can take courses from any track. **However, if learners complete all Programme Electives courses from the same chosen track from semester 5 to semester 8, they will be eligible to receive a Specialization Certificate from the Institute.**

Learners who choose Programme Electives courses from different specialisation tracks from semester 5 to semester 8 will not be eligible for a Specialization Certificate.

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

AIML track: Courses to be chosen for specialization in Artificial Intelligence and Machine Learning

Semester	Course Code	Course Name
V	PEIT21T	Artificial Intelligence
V	PEIT21P	Artificial Intelligence Lab
VI	PEIT25T	Soft Computing
VI	PEIT25P	Soft Computing Lab
VI	PEIT29T	Probabilistic Graphical Model
VI	PEIT29P	Probabilistic Graphical Model Lab
VII	PEIT33T	Data Analytics & Visualization
VII	PEIT33P	Data Analytics & Visualization Lab
VII	PEIT37T	Deep Learning
VII	PEIT37P	Deep Learning Lab
VII	PEIT41T	Natural language processing
VII	PEIT41P	Natural language processing Lab

DS track: Courses to be chosen for specialization in Data Science

Semester	Course Code	Course Name
V	PEIT22T	Advanced Database Management System
V	PEIT22P	Advanced Database Management System Lab
VI	PEIT26T	Data & Feature Engineering
VI	PEIT26P	Data & Feature Engineering Lab
VI	PEIT29T	Probabilistic Graphical Model

Semester	Course Code	Course Name
VI	PEIT29P	Probabilistic Graphical Model Lab
VII	PEIT34T	Big Data Analytics
VII	PEIT34P	Big Data Analytics Lab
VII	PEIT38T	Recommendation Systems
VII	PEIT38P	Recommendation Systems Lab
VII	PEIT42T	Text, Web & Social Media Analytics
VII	PEIT42P	Text, Web & Social Media Analytic Lab

IoT track: Courses to be chosen for specialization in Internet of Things

Semester	Course Code	Course Name
V	PEIT23T	Modern Sensors for IoT
V	PEIT23P	Modern Sensors for IoT Lab
VI	PEIT27T	Principles of IOT
VI	PEIT27P	Principles of IOT Lab
VI	PEIT31T	Embedded System Design with tiny OS
VI	PEIT31P	Embedded System Design with tiny OS Lab
VII	PEIT35T	IoT and Edge Computing
VII	PEIT35P	IoT and Edge Computing Lab
VII	PEIT39T	IoT Security and Trust
VII	PEIT39P	IoT Security and Trust Lab
VII	PEIT43T	Industrial IOT
VII	PEIT43P	Industrial IOT Lab

CSec track: Courses to be chosen for specialization in Computer Security

Semester	Course Code	Course Name
V	PEIT24T	Computer & Network Security
V	PEIT24P	Computer & Network Security Lab
VI	PEIT28T	System Security and Ethical Hacking
VI	PEIT28P	System Security and Ethical Hacking Lab
VI	PEIT32T	Digital Forensics
VI	PEIT32P	Digital Forensics Lab
VII	PEIT36T	Mobile and Wireless Security
VII	PEIT36P	Mobile and Wireless Security Lab
VII	PEIT40T	Malware Analysis
VII	PEIT40P	Malware Analysis Lab
VII	PEIT44T	Web Application Security
VII	PEIT44P	Web Application Security Lab

Appendix-B

Guidelines for Multidisciplinary Elective Courses and Minor Degree

In alignment with the NEP objectives and the evolving demands of the engineering profession, the introduction of a Multidisciplinary Minor Degree within the Undergraduate Engineering Programme aims to foster academic breadth, innovation, and cross-domain competency. These guidelines are formulated to support the structured integration of multidisciplinary elective courses, enabling students to pursue focused study in areas beyond their core engineering discipline.

Department of Information Technology offers the following Multidisciplinary Minor Degree Titles for B.Tech. Information Technology students:

1. Bioinformatics (BI)
2. Innovation, Entrepreneurial and Venture Development (IE)
3. Business Development, Marketing and Finance (BD)
4. Robotics (RB)

It should be noted that it is mandatory to choose one Multidisciplinary Minor (MD M) Degree Programme as a part of B.Tech. Information Technology degree.

Bioinformatics (BI): Courses to be completed successfully for MD M in Bioinformatic.

Semester	Course Code	Course Name
V	MDMBI01	Introduction to Bioinformatics
VI	MDMBI02	Algorithms and Data Structures in Bioinformatics
VII	MDMBI03	Machine Learning Applications in Bioinformatics

Innovation, Entrepreneurial and Venture Development (IE): Courses to be completed successfully for MDM in Innovation, Entrepreneurial and Venture Development.

Semester	Course Code	Course Name
V	MDMIE01	Foundations of Innovation and Entrepreneurship
VI	MDMIE02	Startup Planning and Development
VII	MDMIE03	Innovation Management and Scaling Startups

Business Development, Marketing and Finance (BD): Courses to be completed successfully for MDM in Business Development, Marketing and Finance.

Semester	Course Code	Course Name
V	MDMBD01	Introduction to Business Development and Marketing Principles
VI	MDMBD02	Financial Basics for Engineers and Technopreneurs
VII	MDMBD03	Strategic Marketing and Business Planning

Robotics (RB): Courses to be completed successfully for MD M in Robotics (RB).

Semester	Course Code	Course Name
V	MDMRB01	Fundamentals of Robotics and Control
VI	MDMRB02	Machine Vision and Robotic Perception
VII	MDMRB03	Intelligent Mobile Robotics