



Vidyalankar Institute of Technology

An Autonomous Institute affiliated to University of Mumbai

Bachelor of Technology

in

Information Technology

Programme Structure

(As per AICTE guidelines, 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 Vidyalkar 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 and problem-solving approach 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 each category of courses learnt by learners, internships and projects is finalized considering the scope of study and the ability that a learner should gain through the programme. The overall credits and approach of curriculum proposed is in line with AICTE model curriculum.

The curriculum comprises courses from various categories like basic sciences, humanities and social sciences, engineering sciences, general education and branch specific courses including professional electives and open electives. The curriculum has core courses of branch of engineering positioned and sequenced to achieve sequential and integral learning of the entire breadth of the specific branch. These courses are completed by third year of the engineering programme that enables learners to prepare for higher education during their final year. Professional elective courses, that begin from third year of programme, 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 salient feature of this curricula ensuring employability. Open Elective courses cover multi-disciplinary, special skill development, project management and similar knowledge that make learner capable to work in industrial environment.

For holistic development of learners, apart from technical courses, Humanities and Social Science courses develop the required soft-skills and attitude amongst learners. Our curriculum also introduces Social Service Internship and Internship with institutes abroad along with courses like Design Thinking, Wellness-body, Mind & Spirit, Indian Traditional Knowledge System under General Education category. These general education courses aim to create balance in brain hemispheres and hence improve learners' clarity in thoughts and responses. In addition to this, the curriculum is augmented with Life Enrichment audit courses for knowledge inspiring experience.

Additionally, curriculum provides add-on minor/honours degree that involves field/ domain study. Learner can avail this degree by completing requirement of additional 15 credits.

Thus, the academic plan of VIT envisage 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
Department of Information Technology
Vidyalkar Institute of Technology

Chairman, Academic Council
Vidyalkar Institute of Technology

COMPETENCE BASED CATEGORIES AND CREDIT ALLOTMENT

Sr. No.	Competence	Course Category	Credits / Audit
I	Knowledge	Basic Science	20
II		Engineering Science	15
III		Core	47
IV	Skill	Professional Elective	18
V		Open Elective	15
VI		Project and Internship	17
VII	Attitude	Humanities, Social Sciences and Management	14
VIII		General Education	14
IX		Life Enrichment	Audit
Total			160

Learner is expected to complete requirement of 160 credits (with minimum credits under each category as mentioned above) for B.Tech. degree in Information Technology.

Additionally, learners can choose to avail Minor Degree by completing requirements of 15 credits, which will be over and above the 160 credits required for B.Tech. degree.

Structure of Honours/Minor Degree (Add-on Certification)

Sr. No.	Category	Credits
1	Course Work	9
2	Industrial Interaction	1
3	Survey Report/Paper	1
4	Seminar	1
5	Capstone Project	3
Total		15

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 Categories

I. Basic Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	BS14	Physics	2	2	-	3	1
2	BS01	Engineering Mathematics-I	3	-	-	3	1
3	BS03	Engineering Mathematics-II	3	-	-	3	2
4	BS05	Engineering Mathematics-III	3	-	-	3	3
5	BS17	Biology	2	-	-	2	3
6	BS07	Engineering Mathematics-IV	3	-	-	3	4
7	BS12	Engineering Mathematics-V	3	-	-	3	5

II. Engineering Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	ES04	Structured Programming	2	2	-	3	1
2	ES06	Fundamentals of Computer Hardware and Networking	2	2	-	3	1
3	ES01	Engineering Graphics	2	2	-	3	2
4	ES05	Object Oriented Programming	2	2	-	3	2
5	ES07	Fundamentals of Logic Circuits	2	2	-	3	2

III. Core Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	IT01	Data Structure & Algorithms	2	2	-	3	3
2	IT02	Advanced Java	2	2	-	3	3
3	IT03	Computer Graphics	2	2	-	3	3
4	IT04	Computer Organization & Microprocessor	2	2	-	3	3
5	IT05	Operating Systems	2	2	-	3	4
6	IT06	Computer Networks	2	2	-	3	4
7	IT07	Database Management Systems	2	2	-	3	4
8	IT08	Skill based Lab – Python	-	4	-	2	4
9	IT09	Automata Theory	2	-	1	3	5
10	IT10	Data warehousing & Mining	2	2	-	3	5

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
11	IT11	Artificial Intelligence & Machine Learning	2	2	-	3	5
12	IT12	Software Engineering with WDL	2	2	-	3	5
13	IT13	Cloud Computing	2	2	-	3	6
14	IT14	Software Testing & Quality Assurance	2	2	-	3	6
15	IT15	Mobile Communication & Computing	2	2	-	3	6
16	IT16	DevOps	2	2	-	3	6

IV. Professional Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	IT21	Soft Computing	2	2	-	3	5
2	IT22	Big Data Analytics	2	2	-	3	5
3	IT23	Micro-controller & Embedded System	2	2	-	3	5
4	IT24	Computer & Network Security	2	2	-	3	5
5	IT25	Deep Learning	2	2	-	3	6
6	IT26	Natural Language Processing	2	2	-	3	6
7	IT27	Internet of Things	2	2	-	3	6
8	IT28	System Security & Ethical Hacking	2	2	-	3	6
9	IT29	Information Retrieval	2	2	-	3	7
10	IT30	Deep Learning	2	2	-	3	7
11	IT31	Wireless Sensor Network	2	2	-	3	7
12	IT32	Digital Forensic	2	2	-	3	7
13	IT33	AI in Healthcare	2	2	-	3	7
14	IT34	Recommendation System	2	2	-	3	7
15	IT35	IoT Network & Protocols	2	2	-	3	7
16	IT36	Infrastructure Security	2	2	-	3	7
17	IT37	Reinforcement Learning	2	2	-	3	7
18	IT38	Semantic Web	2	2	-	3	7
19	IT39	Internet of Everything	2	2	-	3	7
20	IT40	Intrusion Detection & Prevention	2	2	-	3	7
21	IT41	Cloud Deployment of ML	2	2	-	3	8
22	IT42	Industrial Applications of DS	2	2	-	3	8

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
23	IT43	IoT Platform & System Design	2	2	-	3	8
24	IT44	Block Chain	2	2	-	3	8

V. Open Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	OE01	Cyber Law	3	-	-	3	7
2	OE02	Project Management	3	-	-	3	7
3	OE03	Product Lifecycle Management	3	-	-	3	7
4	OE04	Sustainability Management	3	-	-	3	7
5	OE05	Operation Research	3	-	-	3	7
6	OE06	IPR and Patenting	3	-	-	3	8
7	OE07	Research Methodology	3	-	-	3	8
8	OE08	Renewable Energy Management	3	-	-	3	8
9	OE09	Energy Audit and Management	3	-	-	3	8
10	OE10	E-Farming	3	-	-	3	8
11	OE11	Bioinformatics	3	-	-	3	8
12	OE12	Nanotechnology	3	-	-	3	8

VI. Project and Internship

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	IT45	Mini Project	-	4	-	2	4
2	IT46	Minor Project-1	-	4	-	2	5
3	IT47	Minor Project-2	-	4	-	2	6
4	IT48	Industry Internship	-	150(total)	-	5	TE Break
5	IT49	Project-1 (Synopsis)	3	-	-	3	7
6	IT50	Project-2 (Final)	1	4	-	3	8

VII. Humanities, Social Sciences and Management Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	HS01	Effective Communication	2	2	-	3	1
2	HS05	E-waste and Environmental Management	2	-	-	2	1
3	HS02	Professional Skills	2	2	-	3	2
4	HS03	Technical and Business Writing	-	4*	-	2	3

5	HS06	Principles of Economics and Management	2	-	1	3	4
6	HS04	Presentation Skills	-	2	-	1	5
*2 hrs. practical class-wise + 2 hrs. of practical batch-wise							

VIII. General Education

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	GE01	Design Thinking	2	-	1	3	2
2	GE02	Social Service Internship/ Project	-	6	-	3	3
3	GE03	Internship with other institutes (Credit Transfer)	2	4	-	4	SE Break
4	GE04	Wellness – Body, Mind & Spirit	1	2	-	2	Any
5	GE05	Basics of Finance & Legal aspects for Business	2	-	-	2	Any
6	GE06	Indian Constitution	2	-	-	2	Any
7	GE07	Universal Human Values	2	-	-	2	Any
8	GE08	Indian Tradition, Art and Culture	2	-	-	2	Any
9	GE09	Corporate and social etiquettes	2	-	-	2	Any
10	GE10	Global Citizenship Education	2	-	-	2	Any

IX. Life Enrichment Courses

Sr. No.	Course Code	Course Title	Hours Per Week (Lecture/Practical/Tutorial)	Credits	Preferred Semester
1	LE01	Photography	2	-	-
2	LE02	Indian Folk Dances	2	-	-
3	LE03	Understanding Indian Classical Music	2	-	-
4	LE04	Wild Life and Conservation	2	-	-
5	LE05	Indian ancient education system	2	-	-
6	LE06	Indian sports	2	-	-
7	LE07	Indian ancient medicinal therapies: Ayurveda	2	-	-
8	LE08	Indian Post: Connecting people	2	-	-
9	LE09	Great entrepreneurs	2	-	-
10	LE10	Success stories of Indian space mission	2	-	-

Sr. No.	Course Code	Course Title	Hours Per Week (Lecture/Practical/Tutorial)	Credits	Preferred Semester
11	LE11	Weather and environment	2	-	-
12	LE12	Unconventional energy	2	-	-

Honours/Minor Degree Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Lecture	Practical	Tutorial		
1	IT63	Industry Interaction	15 (total)	-	-	1	Break of Sem5 and Sem6
2	IT51	Big Data Analytics	2	2	-	3	6
3	IT52	Social Media Analytics	2	2	-	3	6
4	IT53	AI in Robotics	2	2	-	3	6
5	IT54	Cyber Crime Investigation & Digital Forensic	2	2	-	3	6
6	IT64	Survey Report/ Paper	15 (total)	-	-	1	Break of Sem6 and Sem7
7	IT55	Recommendation System	2	2	-	3	7
8	IT56	Information Retrieval	2	2	-	3	7
9	IT57	IoT Security	2	2	-	3	7
10	IT58	Mobile & Wireless Security	2	2	-	3	7
11	IT65	Seminar	15 (total)	-	-	1	Break of Sem7 and Sem8
12	IT59	Social Media Analytics	2	2	-	3	8
13	IT60	Data Visualization	2	2	-	3	8
14	IT61	IoT using RFID	2	2	-	3	8
15	IT62	Detection & Mitigation of Cyber Threats	2	2	-	3	8
16	IT66	Capstone Project	-	6	-	3	8

Course Structure and Evaluation Scheme
for
Bachelor of Technology
in
Information Technology

**First Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: I

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS01	C	Effective Communication	Theory	2	15	20	40	075
		T	Effective Communication	Practical	1	25	-	25	050
2	HS05	C	E-waste and Environmental Management	Theory	2	15	20	40	075
3	BS14	C	Physics	Theory	2	15	20	40	075
		T	Physics	Practical	1	25	-	25	050
4	BS01	C	Engineering Mathematics-I	Theory	3	20	30	50	100
5	ES06	C	Fundamentals of Computer Hardware and Networking	Theory	2	15	20	40	075
		T	Fundamentals of Computer Hardware and Networking	Practical	1	25	-	25	050
6	ES04	C	Structured Programming	Theory	2	15	20	40	075
		T	Structured Programming	Practical	1	25	-	25	050
7	GEXX	E	Any GE course from GE04 to GE10	As per course	2	25	-	50	075
Total Credits					19	-	-	-	-

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESE= End Semester Examination
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**First Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: II

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS02	C	Professional Skills	Theory	2	15	20	40	075
		T	Professional Skills	Practical	1	25	-	25	050
2	BS03	C	Engineering Mathematics-II	Theory	3	20	30	50	100
3	ES01	C	Engineering Graphics	Theory	2	15	20	40	075
		T	Engineering Graphics	Practical	1	25	-	25	050
4	ES07	C	Fundamental of Logic Circuits	Theory	2	15	20	40	075
		T	Fundamental of Logic Circuits	Practical	1	25	-	25	050
5	ES05	C	Object-Oriented Programming	Theory	2	15	20	40	075
		T	Object-Oriented Programming	Practical	1	25	-	25	050
6	GE01	C	Design Thinking	Theory	2	15	20	40	075
		T	Design Thinking	Tutorial	1	50	-	-	050
7	GEXX	E	Any GE course from GE04 onwards	As per course	2	25	-	50	075
Total Credits					20	-	-	-	-

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

C=Compulsory, T=Tandem, E=Elective, A=Audit

**Second Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: III

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS03	C	Technical and Business Writing	Practical	2	50	-	-	050
2	BS05	C	Engineering Mathematics-III	Theory	3	20	30	50	100
3	IT01	C	Data Structure & Algorithms	Theory	2	15	20	40	075
		T	Data Structure & Algorithms	Practical	1	25	-	25	050
4	IT02	C	Advance Java	Theory	2	15	20	40	075
		T	Advance Java	Practical	1	25	-	25	050
5	IT03	C	Computer Graphics	Theory	2	15	20	40	075
		T	Computer Graphics	Practical	1	25	-	25	050
6	IT04	C	Computer Organization & Microprocessor	Theory	2	15	20	40	075
		T	Computer Organization & Microprocessor	Practical	1	25	-	25	050
7	BS17	C	Biology	Theory	2	15	20	40	075
8	GE02	C	Social Service Internship/ Project	Practical	3#	75	-	-	075
Total Credits					22	-	-	-	-

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#For 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).

**Second Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: IV

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS06	C	Principles of Economics and Management	Theory	2	15	20	40	075
		T	Principles of Economics and Management	Tutorial	1	50	-	-	050
2	BS07	C	Engineering Mathematics-IV	Theory	3	20	30	50	100
3	IT05	C	Operating Systems	Theory	2	15	20	40	075
		T	Operating Systems	Practical	1	25	-	25	050
4	IT06	C	Computer Networks	Theory	2	15	20	40	075
		T	Computer Networks	Practical	1	25	-	25	050
5	IT07	C	Database Management Systems	Theory	2	15	20	40	075
		T	Database Management Systems	Practical	1	25	-	25	050
6	IT08	C	Skill based Lab – Python	Practical	2	25	-	50	075
7	IT45	C	Mini Project	Practical	2	25	-	50	075
Total Credits					19	-	-	-	-

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Second Year B.Tech. Information Technology - Summer Break

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)		Total marks (Passing@40% of total marks)
	Code	Nature	Name			Internal	External	
1	GE03	C	Internship with other Institutes (Credit Transfer)	Theory	2	25	25	050
		T	Internship with other Institutes (Credit Transfer)	Practical	2	25	25	050
Total Credits					4	-	-	-

**Third Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: V

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	HS04	C	Presentation Skills	Theory	1	25	-	-	025
2	BS12	C	Engineering Mathematics-V	Theory	3	20	30	50	100
3	IT09	C	Automata Theory	Theory	2	15	20	40	075
		T	Automata Theory	Tutorial	1	50	-	-	050
4	IT10	C	Data warehousing & Mining	Theory	2	15	20	40	075
		T	Data warehousing & Mining	Practical	1	25	-	25	050
5	IT11	C	Artificial Intelligence & Machine Learning	Theory	2	15	20	40	075
		T	Artificial Intelligence & Machine Learning	Practical	1	25	-	25	050
6	IT12	C	Software Engineering with WDL	Theory	2	15	20	40	075
		T	Software Engineering with WDL	Practical	1	25	-	25	050
7	ITXX	E	Professional Elective-1	Theory	2	15	20	40	075
		T	Professional Elective-1	Practical	1	25	-	25	050
8	IT46	C	Minor Project-1	Practical	2	25	-	50	075
Total Credits					21	-	-	-	-

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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.

Professional Elective-1 courses (ITXX)

Course Code	Course Name	Specialization Track Name#
IT21	Soft Computing	Artificial Intelligence & Machine Learning (AIML)
IT22	Big Data Analytics	Data Science (DS)
IT23	Micro-controller & Embedded System	Internet of Things (IoT)
IT24	Computer & Network Security	Computer Security (CSec)

#For details of Specialization Certificate, Refer Appendix-A

Guidelines for Award of Honours/ Minor Degree – Refer Appendix-B

Important Note 2: Before the end of Semester 5, learners are required to go through the Appendix-B carefully to opt for Honours/ Minor Degree Programme. The Honours/ Minor degree programme will span from the end of semester 5 to the end of Semester 8. Learners willing to opt for Honours/ Minor degree programme are required to satisfactorily complete the course titled “Industry Interaction” of 1 credit during the break of the semester 5 and semester 6 which will facilitate them to select Honours/ Minor degree programme of their choice. Detailed guidelines regarding the Honours/ Minor degree programmes of all the departments, Eligibility criterion and Credit requirements are given in Appendix-B. Courses relevant to Honours/ Minor Degree Programmes offered by Department of Information Technology are given in Appendix-C.

**Third Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: VI

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	IT13	C	Cloud Computing	Theory	2	15	20	40	075
		T	Cloud Computing	Practical	1	25	-	25	050
2	IT14	C	Software Testing & Quality Assurance	Theory	2	15	20	40	075
		T	Software Testing & Quality Assurance	Practical	1	25	-	25	050
3	IT15	C	Mobile Communication & Computing	Theory	2	15	20	40	075
		T	Mobile Communication & Computing	Practical	1	25	-	25	050
4	IT16	C	DevOps	Theory	2	15	20	40	075
		T	DevOps	Practical	1	25	-	25	050
5	ITXX	E	Professional Elective-2	Theory	2	15	20	40	075
		T	Professional Elective-2	Practical	1	25	-	25	050
6	IT47	C	Minor Project-2	Practical	2	25	-	50	075
Total Credits					17	-	-	-	-

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Professional Elective-2 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
IT25	Deep Learning	Artificial Intelligence & Machine Learning (AIML)
IT26	Natural Language Processing	Data Science (DS)
IT27	Internet of Things	Internet of Things (IoT)
IT28	System Security & Ethical Hacking	Computer Security (CSec)

#For details of Specialization Certificate, refer Appendix-A

Third Year B. Tech. Computer Engineering - Summer Break

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)		Total marks (Passing@40% of total marks)
	Code	Nature	Name			Internal	External	
1	IT48	C	Industry Internship	Practical	5	50	75	125
Total Credits					5	-	-	-

**Final Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: VII

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	ITXX	E	Professional Elective-3	Theory	2	15	20	40	075
		T	Professional Elective-3	Practical	1	25	-	25	050
2	ITXX	E	Professional Elective-4	Theory	2	15	20	40	075
		T	Professional Elective-4	Practical	1	25	-	25	050
3	ITXX	E	Professional Elective-5	Theory	2	15	20	40	075
		T	Professional Elective-5	Practical	1	25	-	25	050
4	OEXX	E	Any two from the offered	Theory	3	20	30	50	100
5	OEXX	E	Open Elective courses	Theory	3	20	30	50	100
6	IT49	C	Project-1 (Synopsis)	Theory	3	50	-	50	100
Total Credits					18	-	-	-	-

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C=Compulsory, T=Tandem, E=Elective, A=Audit

Professional Elective-3 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
IT29	Information Retrieval	Artificial Intelligence & Machine Learning (AIML)
IT30	Deep Learning	Data Science (DS)
IT31	Wireless Sensor Network	Internet of Things (IoT)
IT32	Digital Forensic	Computer Security (CSec)

#For details of Specialization Certificate, refer Appendix-A

Professional Elective-4 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
IT33	AI in Healthcare	Artificial Intelligence & Machine Learning (AIML)
IT34	Recommendation System	Data Science (DS)
IT35	IoT Network & Protocols	Internet of Things (IoT)
IT36	Infrastructure Security	Computer Security (CSec)

#For details of Specialization Certificate, refer Appendix-A

Professional Elective-5 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
IT37	Reinforcement Learning	Artificial Intelligence & Machine Learning (AIML)
IT38	Semantic Web	Data Science (DS)
IT39	Internet of Everything	Internet of Things (IoT)
IT40	Intrusion Detection & Prevention	Computer Security (CSec)

#For details of Specialization Certificate, refer Appendix-A

**Final Year B. Tech. Information Technology
Course Structure and Evaluation Scheme**

Semester: VIII

Sr. No.	Course			Head of Learning	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name			ISA	MSE	ESE	
1	ITXX	E	Professional Elective-6	Theory	2	15	20	40	075
		T	Professional Elective-6	Practical	1	25	-	25	050
2	OEXX	E	Any three from the offered Open Elective courses	Theory	3	20	30	50	100
3	OEXX	E		Theory	3	20	30	50	100
4	OEXX	E		Theory	3	20	30	50	100
5	IT50	C	Project-2 (Final)	Theory	1	25	-	-	025
		T	Project-2 (Final)	Practical	2	25	-	50	075
Total Credits					15	-	-	-	-

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
C=Compulsory, T=Tandem, E=Elective, A=Audit

Professional Elective-6 Courses (ITXX)

Course Code	Course Name	Specialization Track Name#
IT41	Cloud Deployment of ML	Artificial Intelligence & Machine Learning (AIML)
IT42	Industrial Applications of DS	Data Science (DS)
IT43	IoT Platform & System Design	Internet of Things (IoT)
IT44	Block Chain	Computer Security (CSec)

#For details of Specialization Certificate, refer Appendix-A

Appendix-A

Guidelines for Specialization Certificate (from VIT)

Professional Elective courses are designed to meet industrial requirements. All learners must opt for 6 professional elective courses (1 in Semester 5, 1 in Semester 6, 3 in Semester 7 and 1 in Semester 8) 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. Internet of Things (IoT)
4. Computer Security (CSec)

From semester 5 to semester 8, learners can take courses from any track. **However, if learners complete all professional elective 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 professional elective 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	IT21	Soft Computing
VI	IT25	Deep Learning
VII	IT29	Information Retrieval
VII	IT33	AI in Healthcare
VII	IT37	Reinforcement Learning
VIII	IT41	Cloud Deployment of ML

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

Semester	Course Code	Course Name
V	IT22	Big Data Analytics
VI	IT26	Natural Language Processing
VII	IT30	Deep Learning
VII	IT34	Recommendation Systems
VII	IT38	Semantic Web
VIII	IT42	Industrial Applications of DS

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

Semester	Course Code	Course Name
V	IT23	Microcontrollers & Embedded Systems
VI	IT27	Internet of Things
VII	IT31	Wireless Sensor Networks
VII	IT35	IoT Network & Protocols
VII	IT39	Internet of Everything
VIII	IT43	IoT Platform & System Design

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

Semester	Course Code	Course Name
V	IT24	Computer & Network Security
VI	IT28	System Security & Ethical Hacking
VII	IT32	Digital Forensic
VII	IT36	Infrastructure Security
VII	IT40	Intrusion Detection & Prevention
VIII	IT44	Block Chain

Appendix-B

Guidelines for Award of Honours/ Minor Degree Programme

Honours and Minor Degree programme is introduced in order to facilitate learners to enhance the depth of knowledge, diversity, breadth and skills in emerging fields. An Honours or Minor degree typically refers to a higher level of academic achievement either for research orientation or for improving employability. Learners can select any Honours or Minor degree programme as per his/her choice.

In our curriculum, learners can choose to avail Honours/Minors Degree programme by completing requirements of 15 credits, which will be over and above the credits required for B.Tech. degree. Learner shall opt for Honours or Minor specialisations during the break of Semester 5 and Semester 6. **Learner may complete the B.Tech. degree programme without opting for Honours or Minors degree programme** i.e. opting for Honours/Minor Degree programme is not mandatory as a part of B.Tech. degree programme.

For Honours degree, learner shall select Honour programme offered by his/her own department. Alternatively, for Minor degree, learner shall select Honour programme offered by any other department.

Eligibility Criteria

- Learner should have no backlog in Semester 1,2,3 and 4.
- The CGPI (based on Semester 1,2,3 and 4) of the learner must be 6.75 and above.
- Learner can opt for only one Honours/ Minor degree programme.
- Learners cannot opt for those Honours/ Minor degree programmes which include courses that he/she has chosen under Professional Elective Courses and /or under any other Category of courses.
- Honours/ Minor degree programme can only be opted by a learner during their regular engineering studies.
- Learner must complete the Honours/ Minor degree programme in the stipulated time of 3 semesters only i.e. from end of Semester 5 to end of Semester 8.

Syllabus Scheme Template

Sr. No.	Course			Head of Learning	Sem	Credits	Evaluation Scheme (Marks)			Total marks (Passing@40% of total marks)
	Code	Nature	Name				ISA	MSE	ESE	
1	IT63	C	Industry Interaction	Theory	Break of Sem5 and Sem6	1	25	-	-	025
2	XXXX	E	Honours / Minor Degree Course 1	Theory	6	2	15	20	40	075
		T	Honours / Minor Degree Course 1	Practical	6	1	25	-	25	050
3	XXXX	C	Survey Report/ Paper	Theory	Break of Sem6 and Sem7	1	25	-	-	025
4	XXXX	E	Honours / Minor	Theory	7	2	15	20	40	075

			Degree Course 2							
		T	Honours / Minor Degree Course 2	Practical	7	1	25	-	25	050
5	XXXX	C	Seminar	Theory	Break of Sem7 and Sem8	1	25	-	-	025
6	XXXX	E	Honours / Minor Degree Course 3	Theory	8	2	15	20	40	075
		T	Honours / Minor Degree Course 3	Practical	8	1	25	-	25	050
7	XXXX	C	Capstone Project	Practical	8	3	50	-	50	100
Total Credits						15	-	-	-	-

Honours/ Minor Degree Programmes offered by all departments

Sr.No.	Honors/ Minor Degree Programmes	Department offering Honors	Department offering Minor
1	Data Analytics	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
2	Social Media Insights	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
3	Advanced IoT	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
4	Advanced Cyber Security	<ul style="list-style-type: none"> Information Technology 	<ul style="list-style-type: none"> Computer Engineering Electronics and Computer Science Electronics and Telecommunication Biomedical
5	Intelligent Game Development	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical
6	Data Science and Machine Learning	<ul style="list-style-type: none"> Computer Engineering 	<ul style="list-style-type: none"> Information Technology Electronics and Computer Science Electronics and Telecommunication Biomedical

Programme Structure (2022) for Bachelor of Technology (B.Tech.) – Information Technology

7	Artificial Intelligence and Data Analysis	<ul style="list-style-type: none"> • Computer Engineering 	<ul style="list-style-type: none"> • Information Technology • Electronics and Computer Science • Electronics and Telecommunication • Biomedical
8	Data Science and Forecasting	<ul style="list-style-type: none"> • Computer Engineering 	<ul style="list-style-type: none"> • Information Technology • Electronics and Computer Science • Electronics and Telecommunication • Biomedical
9	Smart City Management	<ul style="list-style-type: none"> • Computer Engineering 	<ul style="list-style-type: none"> • Information Technology • Electronics and Computer Science • Electronics and Telecommunication • Biomedical
10	Cyber Forensic and Penetration	<ul style="list-style-type: none"> • Computer Engineering 	<ul style="list-style-type: none"> • Information Technology • Electronics and Computer Science • Electronics and Telecommunication • Biomedical
11	Crypto Currency	<ul style="list-style-type: none"> • Computer Engineering 	<ul style="list-style-type: none"> • Information Technology • Electronics and Computer Science • Electronics and Telecommunication • Biomedical
12	Intelligent Game Development	<ul style="list-style-type: none"> • Electronics and Computer Science 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Telecommunication • Biomedical
13	Data Engineering	<ul style="list-style-type: none"> • Electronics and Computer Science 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Telecommunication • Biomedical
14	Smart City-Design and Development	<ul style="list-style-type: none"> • Electronics and Computer Science 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Telecommunication • Biomedical
15	Electronic Product Development	<ul style="list-style-type: none"> • Electronics and Computer Science 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Telecommunication • Biomedical
16	Advanced Embedded System	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
17	Intelligent Game Development	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
18	Sentiment Analytics and Data Forecasting	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical

19	Advanced Communication Technology	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
20	Advanced VLSI Technology	<ul style="list-style-type: none"> • Electronics and Telecommunication 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Biomedical
21	AI in Healthcare	<ul style="list-style-type: none"> • Biomedical 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Electronics and Telecommunication
22	Medical IOT	<ul style="list-style-type: none"> • Biomedical 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Electronics and Telecommunication
23	Medical Imaging Technology	<ul style="list-style-type: none"> • Biomedical 	<ul style="list-style-type: none"> • Information Technology • Computer Engineering • Electronics and Computer Science • Electronics and Telecommunication

Detailed list of courses under each Honours/ Minor Degree Programme:

- Learners of Information Technology department can refer to the list of Honours Degree Programme and their corresponding courses in the Appendix-C.
- Learners of Information Technology Department who wish to opt for Minor Degree Programme offered by other department can obtain details of these programmes from Appendix-C of the respective department.

Appendix-C

Honours/ Minor Degree Programmes offered by Department of Information Technology

Department of Information Technology offers the below listed Honours degree programme for learners of Information Technology. The same can be availed as Minor degree programme by learners of other departments.

1. Data Analytics
2. Social Media Insights
3. Advanced IoT
4. Advanced Cyber Security

Courses to be successfully completed as a part of Honours/ Minor Degree Programme

1. Data Analytics

Semester	Course Code	Course Name
VI	IT51	Big Data Analytics
VII	IT55	Recommendation Systems
VIII	IT59	Social Media Analytics

2. Social Media Insights

Semester	Course Code	Course Name
VI	IT52	Social Media Analytics
VII	IT56	Information Retrieval
VIII	IT60	Data Visualization

3. Advanced IoT

Semester	Course Code	Course Name
VI	IT53	AI in Robotics
VII	IT57	IoT Security
VIII	IT61	IoT using RFID

4. Advanced Cyber Security

Semester	Course Code	Course Name
VI	IT54	Cyber Crime Investigation & Digital Forensic
VII	IT58	Mobile & Wireless Security
VIII	IT62	Detection & Mitigation of Cyber Threats

(Draft Copy of Programme Scheme (R-2022), Subject to approval of Academic Council, Vidyalankar Institute of Technology)