

Mahatma Education Society's

Pillai College of Engineering

(Autonomous)

Affiliated to University of Mumbai

Dr. K. M. Vasudevan Pillai's Campus , Sector 16, New Panvel – 410 206.



Department of Information Technology

Curriculum Implementation as per NEP 2020 w.e.f AY 2023-24

of

B.Tech. in Information Technology

for

The Admission Batch of AY 2023-24

First Year - Effective from Academic Year **2023-24**

Second Year - Effective from Academic Year **2024-25**

Third Year - Effective from Academic Year **2025-26**

Fourth Year - Effective from Academic Year **2026-27**

as per

Choice Based Credit and Grading System

Pillai College of Engineering

Vision

Pillai College of Engineering (PCE) will admit, educate and train a diverse population of students who are academically prepared to benefit from the Institute's infrastructure and faculty experience, to become responsible professionals or entrepreneurs in a technical arena. It will further attract, develop and retain, dedicated, excellent teachers, scholars and professionals from diverse backgrounds whose work gives them knowledge beyond the classroom and who are committed to making a significant difference in the lives of their students and the community.

Mission

To develop professional engineers with respect for the environment and make them responsible citizens in technological development both from an Indian and global perspective. This objective is fulfilled through quality education, practical training and interaction with industries and social organizations.



Dr. K. M. Vasudevan Pillai's Campus , Sector - 16, New Panvel – 410 206

Department of Information Technology

Vision

To become a reputable world-class institution that is responsive to national, regional and global development needs through engagement in dynamic knowledge creation, innovation and application.

Mission

To expand the frontiers of knowledge through provision of excellent conditions for teaching-learning and research. To produce graduates who are worthy in character and sound judgments. To contribute to the transformation of society through creativity and innovation. To serve as a dynamic custodian of society's salutary values and thus sustain its integrity.

Program Educational Objectives (PEOs):

Within four years after graduation, the graduates are expected to apply their expertise to contemporary problem solving, be engaged professionally, and have continued to learn and adapt, and have contributed to their organizations through leadership and teamwork. More specifically, the objectives are expertise, engagement, learning, leadership and teamwork.

- I. Graduates should be able to demonstrate peer- recognized expertise together with the ability to articulate that expertise and use it for contemporary problem solving in the analysis, design, and evaluation of computer and software systems, including system integration and implementation.
- II. Graduates should be able to demonstrate engagement in the engineering profession, locally and globally, by contributing to the ethical, competent, and creative practice of engineering or other professional careers.
- III. Graduates should be able to demonstrate sustained learning and adapting to a constantly changing field through graduate work, professional development, and self study.
- IV. Graduates should be able to demonstrate leadership and initiative to ethically advance professional and organizational goals, facilitate the achievements of others, and obtain substantive results.
- V. Graduates should be able to demonstrate a commitment to teamwork while working with others of diverse cultural and interdisciplinary backgrounds.

Program Outcomes:

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSOs are statements that describe what the graduates of a specific engineering program should be able

1. To analyze and appropriately design for developing and deploying the tested system and application softwares to deliver quality products for business success and societal peace.
2. To apply the knowledge of techniques and technologies, ethics, engineering and management principles and soft skills to pursue higher education and become successful entrepreneurs to provide world-wide solutions to real world problems in diverse environments.
3. To provide a safe and healthy tomorrow by researching, evaluating, forecasting and communicating the current and new technologies for an individual or organization for performing tasks related to E-governance, E-Learning, and Training.

The Autonomous status of the institute has given an opportunity to design and frame the curriculum in such a way that it incorporates all the needs and requirements of recent developments in all fields within the scope of the Technical education. This curriculum will help graduates to attain excellence in their respective field. The curriculum has a blend of basic and advanced courses along with provision of imparting practical knowledge to students through minor and major projects. The syllabus has been approved and passed by the Board of Studies.

Outcome based education is implemented in the academics and every necessary step is undertaken to attain the requirements. Every course has its objectives and outcomes defined in the syllabus which are met through continuous assessment and end semester examinations. Evaluation is done on the basis of Choice Based Credit and Grading System (CBCGS). Optional courses are offered at department and institute level. Selection of electives from the same specialization makes the student eligible to attain a B. Tech. degree with respective specialization.

Every learner/student will be assessed for each course through (i) an Internal/Continuous assessment during the semester in the form of either Practical Performance, Presentation, Demonstration or written examination and (ii) End Semester Examination (ESE), in the form of either theory or viva voce or practical, as prescribed by the respective Board Studies and mentioned in the assessment scheme of the course content/syllabus. This system involves the Continuous Evaluation of students' progress Semester wise. The number of credits assigned with a course is based on the number of contact hours of instruction per week for the course. The credit allocation is available in the syllabus scheme of each semester.

The performance of a learner in a semester is indicated by a number called Semester Grade Performance Index (SGPI). The SGPI is the weighted average of the grade points obtained in all the courses by the learner during the semester. For example, if a learner passes five courses (Theory/labs./Projects/ Seminar etc.) in a semester with credits C₁, C₂, C₃, C₄ and C₅ and learners grade points in these courses are G₁, G₂, G₃, G₄ and G₅ respectively, then learners SGPI is equal to:

$$SGPI = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4G_4 + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

The learner's up to date assessment of the overall performance from the time s/he entered for the programme is obtained by calculating a number called the Cumulative Grade Performance Index (CGPI), in a manner similar to the calculation of SGPI. The CGPI therefore considers all the courses mentioned in the scheme of instructions and examinations, towards the minimum requirement of the degree learners have enrolled for. The CGPI at the end of this semester is calculated as,

$$CGPI = \frac{C_1G_1 + C_2G_2 + C_3G_3 + \dots + C_i * G_i + \dots + C_nG_n}{C_1 + C_2 + C_3 + \dots + C_i + \dots + C_n}$$

The Department of Information Technology offers a B. Tech. programme in Information Technology. This is an eight semester course. The complete course is of 160 credits which comprises core courses and elective courses. The elective courses are distributed over 4 specializations. The specializations are:

1. AI and Robotics
2. IoT and Data Analytics
3. Information Security and Forensics
4. UI/UX Design and Testing

The students also have a choice of opting for Institute level specializations. These are

1. Business and Entrepreneurship
2. Bio-Engineering
3. Engineering Design
4. Art and Humanities
5. Applied Science
6. Life Skills, Repair, Maintenance and Safety

As minimum requirements for the credits to be earned during the B.Tech in Information Technology program, a student will have to complete a minimum of three specializations of which two are to be chosen from the department list and one has to be from the Institute level specialization list. In order to complete each specialization, a minimum of three courses under that specialization has to be completed. The credit requirement for the B.Tech. in Information Technology course is tabulated in Table 1.

This curriculum prepared for effective and successful implementation of NEP 2020 w.e.f admission year 2023-24 in accordance with the guidelines set forth by the NEP with a hope to envisage the active engagement and cohesive efforts of all the stakeholders.

Table 1. Distribution of Credits across Four Years B.Tech in Information Technology Degree Programme

SN	Course Category	Group	Credits
1	Basic Science Course (BSC)	BSC / ESC	29
2	Engineering Science Course (ESC)		7
3	Programme Core Course (PCC)	Program Courses	36
4	Programme Elective Course (PEC)		23
5	Multidisciplinary Minor (MD M)	Multidisciplinary Courses	16
6	Open Elective (OE)		6
7	Vocational and Skill Enhancement Course (VSEC)	Skill Courses	10
8	Ability Enhancement Course (AEC)	Humanities Social Science and Management (HSSM)	4
9	Entrepreneurship/Economics/ Management Courses		2
10	Indian Knowledge System (IKS)		2
11	Value Education Course (VEC)		4
12	Research Methodology (RM)	Experiential Learning Courses (ELC)	3
13	Comm. Engg. Project (CEP)/Field Project (FP)		2
14	Project		8
15	Internship/ OJT		8
16	Co-curricular Courses (CC)	Liberal Learning Courses	4
Total Credits =			164

**Program Structure for
Bachelor of Technology in Information Technology
Semester I**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned					
			Theory	Prac	Tut	Theory	Pract	Tut	Total		
FY 101	Engineering Mathematics I	BSC	3	2	-	3	1	-	4		
FY 103	Engineering Physics I	BSC	2	1	-	2	0.5	-	2.5		
FY 105	Engineering Chemistry I	BSC	2	1	-	2	0.5	-	2.5		
FY 111	C Programming	ESC	3	2	-	3	1	-	4		
FY 107	Basic Electrical Engineering *	BSC	3	-	-	3	-	-	3		
FY 117	Basic Engineering Workshop I and BEE Lab	VSEC	-	2+2\$	-	-	2	-	2		
FY 119	Indian Knowledge System (IKS)	HSSM	-	2+2#	-	-	2	-	2		
FY 121	Co-curricular Course I	CC	-	4	-	-	2	-	2		
Total			13	18	-	13	9	-	22		
Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract/ Oral	Total
		Internal Assessment			Avg						
		IA1	IA2	Avg							
FY 101	Engineering Mathematics I	40	40	40	60	2	25	-	125		
FY 103	Engineering Physics I	30	30	30	45	2	25	-	100		
FY 105	Engineering Chemistry I	30	30	30	45	2	25	-	100		
FY 111	C Programming	40	40	40	60	2	25	25	150		
FY 107	Basic Electrical Engineering *	40	40	40	60	2	-	-	100		
FY 117	Basic Engineering Workshop I and BEE Lab	-	-	-	-	-	50+25\$	25\$	100		
FY 119	IKS	-	-	-	-	-	50	-	50		
FY 121	Co-curricular Course I	-	-	-	-	-	50	-	50		
Total					180	270	10	275	50	775	

BSC-Basic Science Course; ESC-Engineering Science Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); VCC-Co-curricular Courses; * Course may be offered in Sem I or Sem II; #Lecture class wise; \$Termwork and viva of BEE

Indian Knowledge System (IKS)

Indian Knowledge System (IKS)	Course 1	Course 2	Course 3	Course 4
		Introduction to IKS	Indian Health Services	Indian Agriculture

**Program Structure for
Bachelor of Technology in Information Technology
Semester II**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned					
			Theory	Pract	Tut	Theory	Pract	Tut	Total		
FY 102	Engineering Mathematics II	BSC	3	2	-	3	1	-	4		
FY 104	Engineering Physics II	BSC	2	1	-	2	0.5	-	2.5		
FY 106	Engineering Chemistry II	BSC	2	1	-	2	0.5	-	2.5		
FY 108	Engineering Mechanics and Graphics *	ESC	3	-	-	3	-	-	3		
FY 110	Java Programming	PCC	3	2	-	3	1	-	4		
FY 112	Professional Communication and Ethics I	AEC	-	2+2#	-	-	2	-	2		
FY 114	Basic Engineering Workshop II and EMG Lab	VSEC	-	2+2\$	-	-	2	-	2		
FY 116	Co-curricular Course II	CC	-	4	-	-	2	-	2		
Total			13	18	-	13	9	-	22		
Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract /Oral	Total
		Internal Assessment			Avg						
		IA 1	IA 2	Avg							
FY 102	Engineering Mathematics II	40	40	40	60	2	25	-	125		
FY 104	Engineering Physics II	30	30	30	45	2	25	-	100		
FY 106	Engineering Chemistry II	30	30	30	45	2	25	-	100		
FY 108	Engineering Mechanics and Graphics *	40	40	40	60	3	-	-	100		
FY 110	Java Programming	40	40	40	60	2	25	25	150		
FY 112	Professional Communication and Ethics I	20	20	20	30	1	25		75		
FY 114	Basic Engineering Workshop II and EMG Lab	-	-	-	-	-	50+25\$	25\$	100		
FY 116	Co-curricular Course II	-	-	-	-	-	50	-	50		
Total			200	300	12	250	50	800			

BSC-Basic Science Course; ESC-Engineering Science Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); VCC-Co-curricular Courses; * Course may be offered in Sem I or Sem II; # Lecture class wise; \$Termwork and viva of GMG

**Program Structure for
Bachelor of Technology in Information Technology
Semester III**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned					
			Theory	Pract	Tut	Theory	Pract	Tut	Total		
IT 201	Engineering Mathematics III	BSC	3	-	1*	3	-	1	4		
IT 203	Data Structure and Analysis of Algorithm	PCC	3	2	-	3	1	-	4		
IT 205	Database Management System	PCC	3	2	-	3	1	-	4		
IT 207	Communication Engineering	MD M	2	-	-	2	-	-	2		
IT 209	Professional Communication II	AEC	-	2	1	-	1	1	2		
IT 211	Human Values and Social Ethics	VEC	2	-	-	2	-	-	2		
IT 213	Programming Lab I (Python)	CEP	-	2+2#	-	-	2	-	2		
Total			13	10	2	13	5	2	20		
Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract /Oral	Total
		Internal Assessment			Avg	Exam					
		IA 1	IA 2	Avg							
IT 201	Engineering Mathematics III	40	40	40	60	2	25	-	125		
IT 203	Data Structure and Analysis of Algorithm	40	40	40	60	2	25	25	150		
IT 205	Database Management System	40	40	40	60	2	25	25	150		
IT 207	Communication Engineering	40	40	40	60	2	-	-	100		
IT 209	Professional Communication II	40	40	40	60	2	-	-	100		
IT 211	Human Values and Social Ethics	-	-	-	-	-	50	-	50		
IT 213	Programming Lab I (Python)	-	-	-	-	-	25	25	50		
Total		200	300	10	150	75	725				

PCC-Programme Core Course; BSC-Basic Science Course; ESC-Engineering Science Course; Open Elective (OE); MD M-Multidisciplinary Minor; HSSM-Humanities Social Science and Management; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); ELC-Experiential Learning Courses; VCC-Co-curricular Courses; *Tutorial 1hr Batchwise; #Lecture class wise

Program Structure for
Bachelor of Technology in Information Technology
Semester IV

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned				
			Theory	Pract	Tut	Theory	Pract	Tut	Total	
IT 202	Engineering Mathematics IV	BSC	3	-	1*	3	-	1	4	
IT 204	Automata Theory and System Software	PCC	3	-	1	3	-	1	4	
IT 206	Operating Systems	PCC	3	2	-	3	1	-	4	
IT 208	Computer Architecture and Logic Design	MD M	3	-	-	3	-	-	3	
IT 210	Personal Finance Management	HSSM	2	-	-	2	-	-	2	
IT 212	Innovation and Entrepreneurship	VEC	2	-	-	2	-	-	2	
IT 214	Programming Lab II (Web)	VSEC	-	2	-	-	1	-	1	
	Total		16	4	2	15	2	2	20	
Course Code	Course Name	Examination Scheme								
		Theory					Exam Duration (Hrs)	Term Work	Pract /Oral	Total
		Internal Assessment			End Sem Exam					
		IA 1	IA 2	Avg						
IT 202	Engineering Mathematics IV	40	40	40	60	2	25	-	125	
IT 204	Automata Theory and System Software	40	40	40	60	2	25	-	125	
IT 206	Operating Systems	40	40	40	60	2	25	25	150	
IT 208	Computer Architecture and Logic Design	40	40	40	60	2	-	-	100	
IT 210	Personal Finance Management	20	20	20	40	2	-	-	60	
IT 212	Innovation and Entrepreneurship	-	-	-	-	-	50	-	50	
IT 214	Programming Lab II (Web)	-	-	-	-	-	25	25	50	
	Total				180	280	10	150	50	660

PCC-Programme Core Course; BSC-Basic Science Course; ESC-Engineering Science Course; Open Elective (OE); MD M-Multidisciplinary Minor; HSSM-Humanities Social Science and Management; SEC-Skill Enhancement Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); ELC-Experiential Learning Courses; VCC-Co-curricular Courses; *Tutorial 1hr Batchwise; #Lecture class wise

**Program Structure for
Bachelor of Technology in Information Technology
Semester V**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned					
			Theory	Pract	Tut	Theory	Pract	Tut	Total		
IT 301	Computer Network and Security	PCC	3	2	-	3	1	-	4		
IT 303	Machine Intelligence	PCC	3	2	-	3	1	-	4		
IT 305	Microprocessor and Microcontroller	MD	3	-	-	3	-	-	3		
IT 3XY	DLOC I	PEC	3	2	-	3	1	-	4		
IL 3XX	ILOC I	OE	3	-	-	3	-	-	3		
IT 307	Programming Lab III (Android)	VSEC	-	2+2#	-	-	2	-	2		
Total			15	10	-	15	5	-	20		
Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract /Oral	Total
		Internal Assessment			Avg	Total					
		IA 1	IA 2	IA 3							
IT 301	Computer Network and Security	40	40	40	60	2	25	25	150		
IT 303	Machine Intelligence	40	40	40	60	2	25	-	125		
IT 305	Microprocessor and Microcontroller	40	40	40	60	2	-	-	100		
IT 3XY	DLOC I	40	40	40	60	2	25	25	150		
IL 3XX	ILOC I	40	40	40	60	2	-	-	100		
IT 307	Programming Lab III (Android)	-	-	-	-	-	25	25	50		
Total			200	300	10	100	75	675			

PCC-Programme Core Course; BSC-Basic Science Course; ESC-Engineering Science Course; Open Elective (OE); MD M-Multidisciplinary Minor; HSSM-Humanities Social Science and Management; SEC-Skill Enhancement Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); ELC-Experiential Learning Courses; VCC-Co-curricular Courses; *Tutorial 1hr Batchwise; #Lecture class wise

Sem- V DLOC	1. AI and Robotics	2. IoT and Data Analytics	3. Information Security and Forensics	4. UI/UX Design and Testing
DLOC I	IT 311	IT 312	IT 313	IT 314
	Image and Video Processing	Wireless Technology and 5G	Cryptography and Security	Augmented and Virtual Reality

Sem- V ILOC	1. Business and Entrepreneurship	2. Bio-Engineering	3. Engineering Design	4. Art and Humanities	5. Applied Science	6. Life Skills, Repair, Maintenance and Safety
ILOC I	IL	IL	IL	IL	IL	IL
	IPR and Patenting	Introduction to Bioengineering	Product Design	Visual Art	Computational Physics	Vehicle Safety

**Program Structure for
Bachelor of Technology in Information Technology
Semester VI**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned			
			Theory	Pract	Tut	Theory	Pract	Tut	Total
IT 303	Software Engineering and Project Management	MD	3	2	-	3	1	-	4
IT 305	Data Mining and Business Intelligence	PCC	3	-	-	3	-	-	3
IT 3XY	DLOC II	PEC	3	2	-	3	1	-	4
IT 3XY	DLOC III	PEC	3	2	-	3	1	-	4
IL 3XX	ILOC II	OE	3	-	-	3	-	-	3
IT 307	Major Project I	VSEC	-	4	-	-	2	-	2
Total			15	10	-	15	5	-	20

Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract/ Oral	Total
		Internal Assessment			Avg	Exam Duration (Hrs)					
		IA 1	IA 2	Avg							
IT 303	Software Engineering and Project Management	40	40	40	60	2	25	25	150		
IT 305	Data Mining and Business Intelligence	40	40	40	60	2	-	-	100		
IT 3XY	DLOC II	40	40	40	60	2	25	25	150		
IT 3XY	DLOC III	40	40	40	60	2	25	25	150		
IL 3XX	ILOC I	40	40	40	60	2	-	-	100		
IT 307	Major Project I	-	-	-	-	-	25	25	50		
Total		200	300	10	100	100	100	100	700		

PCC-Programme Core Course; BSC-Basic Science Course; ESC-Engineering Science Course; Open Elective (OE); MD M-Multidisciplinary Minor; HSSM-Humanities Social Science and Management; SEC-Skill Enhancement Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); ELC-Experiential Learning Courses; VCC-Co-curricular Courses; *Tutorial 1hr Batchwise; #Lecture class wise

Sem-VI Specialization	1. AI and Robotics	2. IoT and Data Analytics	3. Information Security and Forensics	4. UI/UX Design and Testing
DLOC II	IT 321	IT 322	IT 323	IT 324
	Genetic Algorithms and Fuzzy Systems	Internet of Everything	Cyber Security	Usability Engineering
DLOC III	IT 331	IT 332	IT 333	IT 334
	Deep Learning	Big Data Analytics	Penetration Testing	Ubiquitous Computing

Sem- VI ILOC	1. Business and Entrepreneurship	2. Bio-Engineering	3. Engineering Design	4. Art and Humanities	5. Applied Science	6. Life Skills, Repair, Maintenance and Safety
ILOC II	IL	IL	IL	IL	IL	IL
	e- Commerce and e-Business	Medical Image Processing	Technologies for Rural Development	Economics	GIS and Remote Sensing	Maintenance of Electronics and Mechanical Equipment

**Program Structure for
Bachelor of Technology in Information Technology
Semester VII**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned					
			Theory	Pract	Tut	Theory	Pract	Tut	Total		
IT 401	Cloud Computing	PCC	3	-	-	3	-	-	3		
IT 402	Data Science and Visualization	MD	3	2	-	3	1	-	4		
IT 403	Skill Lab I (R Programming)	VSEC	-	2	-	-	1	-	1		
IT 4XY	DLOC IV	PEC	3	2	-	3	1	-	4		
IT 4XY	DLOC V	PEC	3	2	-	3	1	-	4		
IT 492	Major Project II	Project	-	8	-	-	4	-	4		
Total			12	16	-	12	8	-	20		
Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract /Oral	Total
		Internal Assessment			Avg						
		IA 1	IA 2								
IT 401	Cloud Computing	40	40	40	60	2	-	-	100		
IT 402	Data Science and Visualization	40	40	40	60	2	25	25	150		
IT 403	Skill Lab I (R Programming)	-	-	-	-	-	25	25	50		
IT 4XY	DLOC IV	40	40	40	60	2	25	25	150		
IT 4XY	DLOC V	40	40	40	60	2	25	25	150		
IT 492	Major Project II	-	-	-	-	-	100	50	150		
Total			160	240	8	225	150	775			

PCC-Programme Core Course; BSC-Basic Science Course; ESC-Engineering Science Course; Open Elective (OE); MD M-Multidisciplinary Minor; HSSM-Humanities Social Science and Management; OJT-On Job Training; SEC-Skill Enhancement Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); ELC-Experiential Learning Courses; VCC-Co-curricular Courses; *Tutorial 1hr Batchwise; #Lecture class wise

Sem-VII Specialization	1. AI and Robotics	2. IoT and Data Analytics	3. Information Security and Forensics	4. UI/UX Design and Testing
DLOC IV	IT 441	IT 442	IT 443	IT 444
	Natural Language Processing	Industrial IOT	Digital Forensics	Software Testing and Quality Assurance
DLOC V	IT 451	IT 452	IT 453	IT 454
	Computer Vision	Information Retrieval	Multimedia Forensics	Metaverse Technology

**Program Structure for
Bachelor of Technology in Information Technology
Semester VIII**

Course Code	Course Name	Course Category	Teaching Scheme (Contact Hours)			Credits Assigned					
			Theory	Pract	Tut	Theory	Pract	Tut	Total		
IT 404	Research Methodology	RM	3	-	-	3	-	-	3		
IT 4xx	DLOC VI	PEC	3	-	-	3	-	-	3		
IT 405	Skill Lab II (DevOps)	SEC	-	4	-	-	2	-	2		
IT 492	Internship	OJT	-	24	-	-	8	-	8		
IT 493	Major Project III	Project	-	8	-	-	4	-	4		
Total			6	32	-	6	14	-	20		
Course Code	Course Name	Examination Scheme									
		Theory					End Sem Exam	Exam Duration (Hrs)	Term Work	Pract/ Oral	Total
		Internal Assessment			Avg						
		IA 1	IA 2								
IT 404	Research Methodology	40	40	40	60	2	-	-	100		
IT 4xx	DLOC VI	40	40	40	60	2	-	-	100		
IT 405	Skill Lab II (DevOps)	-	-	-	-	-	25	25	50		
IT 492	Internship	-	-	-	-	-	100	100	200		
IT 493	Major Project III	-	-	-	-	-	50	50	100		
Total			80	120-	4	150	150	500			

PCC-Programme Core Course; BSC-Basic Science Course; ESC-Engineering Science Course; Open Elective (OE); MD M-Multidisciplinary Minor; HSSM-Humanities Social Science and Management; OJT-On Job Training; SEC-Skill Enhancement Course; VSEC-Vocational Skill and Skill Enhancement Course; VSC - Vocational Skill Course; AEC-Ability Enhancement Course; IKS-Indian Knowledge System; Value Education Course (VEC); ELC-Experiential Learning Courses; VCC-Co-curricular Courses; *Tutorial 1hr Batchwise; #Lecture class wise

Semester VIII Specialization	1. AI and Robotics	2. IoT and Data Analytics	3. Information Security and Forensics	4. UI/UX Design and Testing
DLOC VI	IT 461	IT 462	IT 463	IT 464
	Robotics	Social Media Analytics	Social Frauds and Privacy	User Interface Design

Department Level Optional Courses (DLOC)
Bachelor of Technology in Information Technology

Semester	DLOC	1. AI and Robotics	2. IoT and Data Analytics	3. Information Security and Forensics	4. UI/UX Design and Testing
Sem-V	DLOC-I	IT 311	IT 312	IT 313	IT 314
		Image and Video Processing	Wireless Technology and 5G	Cryptography and Security	Augmented and Virtual Reality
Sem-VI	DLOC-II	IT 321	IT 322	IT 323	IT 324
		Genetic Algorithms and Fuzzy Systems	Internet of Everything	Cyber Security	Usability Engineering
	DLOC-III	IT 331	IT 332	IT 333	IT 334
		Deep Learning	Big Data Analytics	Penetration Testing	Ubiquitous Computing
Sem-VII	DLOC-IV	IT 441	IT 442	IT 443	IT 444
		Natural Language Processing	Industrial IOT	Digital Forensics	Software Testing and Quality Assurance
	DLOC-V	IT 451	IT 452	IT 453	IT 454
		Computer Vision	Information Retrieval	Multimedia Forensics	Metaverse Technology
Sem-VIII	DLOC-VI	IT 461	IT 462	IT 463	IT 464
		Robotics	Social Media Analytics	Social Frauds and Privacy	User Interface Design

Semester Wise Breakup of Marks and Credits
Bachelor of Technology in Information Technology

FE 2023-24	Sem 1		Sem 2		Sem 3		Sem 4		Sem 5		Sem 6		Sem 7		Sem 8	
	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks
Course 1	4	125	4	125	4	125	4	125	4	150	4	150	3	100	3	100
Course 2	2.5	100	2.5	100	4	150	4	125	4	125	3	100	4	150	3	100
Course 3	2.5	100	2.5	100	4	150	4	150	3	100	4	150	1	50	2	50
Course 4	4	150	3	100	2	100	3	100	4	150	4	150	4	150	8	200
Course 5	3	100	4	150	2	100	2	60	3	100	3	100	4	150	4	100
Course 6	2	100	2	75	2	50	2	50	2	50	2	50	4	150		
Course 7	2	50	2	100	2	50	1	50								
Course 8	2	50	2	50												

Total =	22	775	22	800	20	725	20	660	20	675	20	700	20	750	20	550
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Total Credits = 164

Total Marks = 5635