

Mahatma Education Society's

Pillai University

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



School of Engineering

Syllabus *of*

B.Tech. in Computer Engineering

for

The Admission Batch of AY 2026-27

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

Second Year - Effective from Academic Year **2027-28**

Third Year - Effective from Academic Year **2028-29**

Fourth Year - Effective from Academic Year **2029-30**

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 Computer Engineering

Vision

To evolve as a centre of academic excellence and to adapt itself to the rapid advancements in the Computer Engineering field.

Mission

To produce highly qualified, well rounded and motivated graduates who can meet new technical challenges, contribute effectively as team members and be innovators in computer hardware, software, design and application. To pursue creative research and new technologies in computer engineering and across disciplines in order to serve the needs of industry, government, society and the scientific community. To inculcate strong ethical values and responsibility towards society.

Program Educational Objectives (PEOs):

- I. Our graduates will have knowledge, skills and attitude that will allow them to contribute significantly to the research and the discovery of new knowledge and methods in computing and enable them to communicate effectively and work in a team.
- II. Our graduates will function ethically and responsibly, and will remain informed and involved as full participants in our profession and our society. Our graduates will successfully function in multi-disciplinary teams.
- III. Our graduates will apply the basic principles and practices of engineering in the computing domain to the benefit of society and to pursue lifelong learning and professional developments.
- IV. Our graduates will use theoretical and technical computer science knowledge to specify requirements, develop a design, and implement and verify a solution for computing systems of different levels of complexity.

Knowledge and Attitude Profile (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

Program Outcomes:

Engineering Graduates will be able to:

1. Engineering knowledge:
Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
2. Problem analysis:
Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
3. Design/development of solutions:
Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
4. Conduct investigations of complex problems:
Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid

- conclusions. (WK8).
5. Engineering Tool Usage:
Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
 6. The engineer and The World:
Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
 7. Ethics:
Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
 8. Individual and Collaborative Team work:
Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
 9. Communication:
Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
 10. Project management and finance:
Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
 11. Life-long learning:
Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

Program Specific Outcomes (PSOs):

1. To analyze, design and develop computer programs using appropriate hardware, software and mathematical models in the areas related to algorithms, system software, multimedia, mobile and web technology, data storage and computing, and networking for efficient and secure systems.
2. To use professional engineering practices, logic and strategies for creating innovative career paths to be an entrepreneur, and an urge to pursue higher studies.
3. To Formulate and solve real life engineering problems for the public health and safety with social and environmental awareness along with ethical responsibility.

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 a very 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 Computer Engineering offers a B. Tech. programme in Computer Engineering. This is an eight-semester course. The complete course is a **173 credit** course which comprises core courses and elective courses. The **department level elective courses/Program Elective courses** are distributed over 4 specializations. The specializations are:

1. Artificial Intelligence and Data Science
2. Cloud and Cyber Security
3. Robotics and Automation
4. Human Computer Interaction.

The students also have a choice of opting for **Institute level specializations/Open electives** . These are

- 1 Entrepreneurship Development and Management
- 2 Business Management
- 3 IP Management
- 4 Bioengineering
- 5 Bio Instrumentation
- 6 Engineering Design
- 7 Sustainable Technologies
- 8 Contemporary Studies
- 9 Art and Journalism
- 10 Applied Science
- 11 Green Technologies
- 12 Maintenance Engineering
- 13 Life Skills
- 14 Environment & Safety

The credit requirement for the B.Tech. in Computer Engineering course is tabulated in Table 1.

Table 1. Credit Requirement for B.Tech in Computer Engineering

Course Type		Total Credits
BSC/ESC	Basic Science Course	18
	Engineering Science Course	18
Program Courses	Program Core Course (PCC)	53
	Program Elective Course (PEC)	20
Multidisciplinary Courses	Multidisciplinary Minor (MDM)	13
	Open Electives (OE) Other than a particular program	6
Skill Courses	Vocational and Skill Enhancement Course (VSEC)	8
Humanities Social Science and Management (HSSM)	Ability Enhancement Course (AEC-01, AEC-02)	4
	Entrepreneurship/Economics/Management Courses	4
	Indian Knowledge System (IKS)	2
	Value Education Course (VEC)	2
Experiential Learning Courses	Research Methodology	3
	Communication Engineering Project (CEP)/Field Project (FP)	3
	Project	7
	Internship/ On Job Training (OJT)	8
Liberal Learning Courses	Co-curricular Courses (CC)	4
Suggested Total Credits		173

Exit policy

As per the Maharashtra Government G.R.dated 04th July 2023 and referring to Mumbai University NEP curriculum, the following Exit and Entry criteria are suggested for Pillai College of Engineering students admitted from A.Y. 2023-24 under NEP 2020 curriculum.

Multiple Exits: Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs.

1. Students exiting the First Year programme after securing **44 credits** will be awarded a UG Certificate in the relevant Discipline /Subject. In case the first year credits are a **minimum of 40**, the candidate needs to secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation, in addition to 4 credits from skill-based courses earned during the first and second semester.
2. Students exiting the Second Year Programme after securing **88 credits** will be awarded a UG Diploma in the relevant Discipline /Subject. In case the total number of credits is a **minimum of 80**, the candidate needs to secure an additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects, etc) offered during summer vacation after the second year.
3. Students exiting the 3-year UG program will be awarded B.Voc. in the relevant Discipline /Subject upon securing a **minimum of 120 credits** with an additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects, etc.) offered during summer vacation after the sixth semester.
4. Exit options shall be provided with Certification, Diploma, and B. Vocational degrees to the students at the end of the second, fourth, and sixth semesters, respectively, in the four-year degree programme. Students will receive a Bachelor's degree with a single minor on successfully completing all eight semesters of the UG Programmes either at a stretch or with opted exits and re-entries. In addition to this, students will receive a Bachelor's degree with a Double Minor/Honours/ Research subject to earning an additional 18 credits.

Re-entry or Lateral Entry: Students, opting for exits at any level, will have the option to re-enter the programme from where they had left off, in the same or a different higher education institution within four years of exit and complete the degree programme within the stipulated maximum period of eight years from the date of admission to first year UG. Re-entry at various levels for lateral entrants in academic programmes shall be based on the earned and valid credits as deposited and accumulated in the Academic Bank of Credits (ABC) through Registered Higher & Technical Education Institutions (RHTEI) and proficiency test records. Lateral entry into the programme of study leading to the UG Diploma/ B. Vocational/ UG Bachelor's Degree with single minor/ UG Bachelor's Degree with Double Minor/ Honours /Research will be based on the validation of prior learning outcomes achieved and subject to availability based on intake capacity.

Preface by Board of Studies in Computer Engineering

Dear Students and Teachers, we, the members of Board of Studies Computer Engineering, are very happy to present the B.Tech Computer Engineering syllabus effective from the Academic Year 2021-22 . We are sure you will find this syllabus interesting, challenging, and fulfill certain needs and expectations.

Computer Engineering is one of the most sought-after courses amongst engineering students. The syllabus needs revision in terms of preparing the student for the professional scenario relevant and suitable to cater the needs of industry in the present-day context. The syllabus focuses on providing a sound theoretical background as well as good practical exposure to students in the relevant areas. It is intended to provide a modern, industry-oriented education in Computer Engineering. It aims at producing trained professionals who can successfully become acquainted with the demands of the industry worldwide. They obtain skills and experience in up-to-date knowledge to analysis design, implementation, validation, and documentation of computer software and systems.

This syllabus is finalized through a brainstorming session attended by Heads of Department and senior faculty members of Department of Computer Engineering. The syllabus falls in line with the vision and mission of the Computer Engineering Department and various accreditation agencies by keeping an eye on the technological developments, innovations, and industry requirements.

We would like to place on record our gratitude to the faculty, students, industry experts and stakeholders for having helped us in the formulation of this syllabus.

Board of Studies in Computer Engineering

1	Dr. Sharvari S. Govilkar	Coordinator (Chairman)
2	Dr.Nilesh Marathe	Subject experts from other Universities
3	Dr. Dipti Durgesh Patil	Subject experts from other Universities
4	Mr.Nikhil Mahadeshwar,	Industry Expert nominated by Dean
5	Mr. Akash Deshmukh	Alumni employed in industry
6	Dr. Gayatri Hegde	Expert from an interdisciplinary or allied field
7	Dr. Jyoti Deshmukh	Senior faculty of the department
8	Dr.Dhiraj Amin	Senior faculty of the department

Program Structure for First Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2026-27
Semester I

Course Code	Course Name	Category	Teaching Scheme (Contact Hours)		Credits Assigned				
			Theory	Pract.	Theory	Pract.	Total		
MATH 101	Engineering Mathematics I	BSC	2	2	2	1	3		
PHY 101	Engineering Physics I	BSC	2	1	2	0.5	2.5		
CHEM 101	Engineering Chemistry I	BSC	2	1	2	0.5	2.5		
MECH 101	Engineering Mechanics and Graphics I	ESC	3	2	3	1	4		
CE 101	Programming with C	ESC	3	2	3	1	4		
HUM 102	Ancient Indian Engineering (IKS)	HSSM	2	-	2	-	2		
ENGG 101	Skill Enhancement Course I (Hands on Skills I)	VSEC	-	4	-	2	2		
ENGG 102	Co-curricular Course I	Liberal learning	-	4	-	2	2		
	IDC I	Liberal learning	2	-	Audit Course(Non Credit)				
Total					14	8	22		
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Oral/ Pract.	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2	Average					
MATH 101	Engineering Mathematics I	30	30	30	45	2	25	-	100
PHY 101	Engineering Physics I	30	30	30	45	2	25	-	100
CHEM 101	Engineering Chemistry I	30	30	30	45	2	25	-	100
MECH 101	Engineering Mechanics and Graphics I	40	40	40	60	2	25	25	150
CE 101	C Programming	40	40	40	60	2	25	25	150
HUM 102	Ancient Indian Engineering (IKS)	-	-	-	-	-	50	-	50
ENGG 101	Skill Enhancement Course I (Hands on Skills I)	-	-	-	-	-	50	-	50
ENGG 102	Co-curricular Course I	-	-	-	-	-	50	-	50
Total									750

*- The course can be offered in either SEM I or SEM II

**Program Structure for First Year
Bachelor of Technology in Computer Engineering**

W.E.F. A.Y. 2026-27

Semester II

Course Code	Course Name	Category	Teaching Scheme (Contact Hours)		Credits Assigned				
			Theory	Pract.	Theory	Pract.	Total		
MATH 104	Applied Mathematics For Computer Engineering and AI-DS	BSC	2	2	2	1	3		
PHY 103	Physics for Quantum Computing	BSC	2	1	2	0.5	2.5		
CHEM 102	Environmental Chemistry	BSC	2	1	2	0.5	2.5		
ENGG 103	Basic Electrical Engineering	ESC	3	2	3	1	4		
CE 102	Programming with JAVA	PCC	3	2	3	1	4		
COMM 104	Applied Critical Thinking	HSSM	1	2	1	1	2		
ENGG 104	Skill Enhancement Course II - Computer Hardware	VSEC	--	2	-	1	1		
ENGG 107	Skill Enhancement Course III - Open Source Technology	VSEC	-	2	-	1	1		
ENGG 108	Co-curricular Course II	Liberal learning	-	4		2	2		
	IDC II	Liberal learning	2	-	Audit Course(Non Credit)				
					14	8	22		
Course Code	Course Name	Examination Scheme							
		Theory						Term Work	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2	Average					
MATH 104	Applied Mathematics For Computer Engineering and AI-DS	30	30	30	45	2	25	-	100
PHY 103	Physics for Quantum Computing	30	30	30	45	2	25	-	100
CHEM 102	Environmental Chemistry	30	30	30	45	2	25	-	100
ENGG 103	Basic Electrical Engineering	40	40	40	60	2	25		150
CE 102	Programming with JAVA	40	40	40	60	2	25	25	150
COMM 104	Applied Critical Thinking	-	-	-	-	-		50	50

ENGG 104	Skill Enhancement Course II - Computer Hardware						50	50
ENGG 107	Skill Enhancement Course III - Open Source Technology						50	50
ENGG 108	Co-curricular Course II						50	50
Total								800

*- The course can be offered in either SEM I or SEM II

AY 2026-27

Program Structure for Second Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2027-28
Semester III

Course Code	Course Name	Category	Teaching Scheme (Contact Hours)			Credits Assigned			
			Theory	Pract	Tut.	Theory	Pract.	Tut.	Total
MATH 201C	Applied Mathematics for computer Engineering-I	Multidisciplinary Courses	3	2	-	3	1	-	4
CE 201	Data Structures	PCC	3	2	-	3	1	-	4
CE 202	Database design and Management Systems	PCC	3	2	-	3	1	-	4
CE 203	Operating System	PCC	3	2	-	3	1	-	4
CE 204	Digital Logic and Computer Organization Architecture	Multidisciplinary Courses	3	-	-	3	-	-	3
HUM 201	Human Values and Social Ethics/ IDC III	HSSM	2	-	-	2	-	-	2
CE 205	Python Programming	Experiential Learning Courses	1	2	-	-	2	-	2
Total						17	6		23
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Oral/ Pract.	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2						
MATH 201C	Applied Mathematics for computer Engineering-I	40	40	40	60	2	25	-	125
CE 201	Data Structures	40	40	40	60	2	25	25	150
CE 202	Database design and Management Systems	40	40	40	60	2	25	25	150
CE 203	Operating System	40	40	40	60	2	25	25	150
CE 204	Digital Logic and Computer Organization Architecture	40	40	40	60	2	-	-	100
HUM 201	Human Values and Social Ethics/ IDC III	-	-	-	-	-	50	-	50
CE 205	Python Programming	-		-	-	-	50	25	75
Total			-	200	300	-	200	100	800

* Batchwise tutorial of One hour to be conducted.

Theory class to be conducted for full class .

Program Structure for Second Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2027-28
Semester IV

Course Code	Course Name	Category	Teaching Scheme (Contact Hours)			Credits Assigned			
			Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
MATH 202C	Applied Mathematics for computer Engineering-II	Multidisciplinary Courses	2	-	-	2	-	-	2
CE 206	Design and Analysis of Algorithm	PCC	3	2	-	3	1	-	4
CE 207	Computer Networks	PCC	3	2	-	3	1	-	4
CE 208	Computational Graphics & Virtual Reality	PCC	3	2	-	3	1	-	4
CE 209	Microprocessor and Microcontroller	Multidisciplinary Courses	3	-	-	3	-	-	3
ENGG 201	Entrepreneurship / IDC IV	HSSM	2	-	-	2	-	-	2
CE 210	Full stack Development	VSEC	-	2+2#	-	-	2	-	2
MGMT 290	Personal Finance Management	HSSM	2	-	-	2	-	-	2
Total						18	5		23
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Oral/ Pract.	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2	Average					
MATH 202C	Applied Mathematics for computer Engineering-II	20	20	20	40	2	-	-	60
CE 206	Design and Analysis of Algorithm	40	40	40	60	2	25	25	150
CE 207	Computer Networks	40	40	40	60	2	25	25	150
CE 208	Computational Graphics & Virtual Reality	40	40	40	60	2	-	-	100
CE 209	Microprocessor and Microcontroller	40	40	40	60	2	-	-	100

ENGG 201	Entrepreneurship / IDC IV	20	20	20	40	2	-	-	60
CE 210	Full stack Development	20	20	20	40	2	-	-	60
MGMT 290	Personal Finance Management	20	20	20	40	2	-	-	60
Total				280	400	-	50	50	740

*** Batchwise tutorial of One hour to be conducted.**

Theory class to be conducted for full class .

AY 2026-27

Program Structure for Third Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2028-29
Semester V

Course Code	Course Name	Category	Teaching Scheme (Contact Hours)			Credits Assigned			
			Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
CE 301	Theory of Computation	PCC	3	-	—	3	—	—	3
CE 302	Artificial Intelligence	PCC	3	2	—	3	1	—	4
CE 303	Software Engineering	PCC	3	2	—	3	1	—	4
CE 304	Digital Image Processing	Multidisciplinary Courses	3	-	—	3	-	—	3
COMM 202	Professional Communication and Ethics II	HSSM	2	-	-	2	-	-	2
CE 3xx	Department Level Optional Course I	PEC	3	2	—	3	1	—	4
	IDC V	OE (Select 1)	2	-		2	-	-	2
						19	3	-	22
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Oral/ Pract.	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2	Average					
CE 301	Theory of Computation	40	40	40	60	2	—	—	100
CE 302	Artificial Intelligence	40	40	40	60	2	25	25	150
CE 303	Software Engineering	40	40	40	60	2	25	25	150
CE 304	Digital Image Processing	40	40	40	60	2	-	-	100
COMM 202	Professional Communication and Ethics II	20	20	20	40	2	-	-	60
CE 3xx	Department Level Optional Course I	40	40	40	60	2	25	25	150
	IDC V	20	20	20	40	2	-	-	100
Total				360	560		75	75	810

* Batchwise tutorial of One hour to be conducted.

Theory class to be conducted for full class .

Specializations→	Artificial Intelligence and Data Science	Cloud and Cyber Security	Robotics and Automation	Human Computer Interaction
Course Code	CE 306	CE 307	CE 308	CE 309
Department Level Optional Course I (DLOC I)	Data Warehouse and Data Mining	Cryptography and System Security	IoT and Embedded Systems for Applications	Human Computer Interaction

SEM V - ILOC I

SN	Specialization	Course 1 (Semester V)	
1	IP Management and Digital Business	ENG 380	IPR and Patenting
2	Business Management	MGMT 380	E- Commerce and E-Business
3	Bio Engineering	ENG 381	Introduction to Bioengineering
4	Bio Instrumentation	ENG 382	Biomedical Instrumentation
5	Engineering Design	DES 380	Design of Experiments
6	Sustainable Technologies	DES 381	Design for Sustainability
7	Contemporary Studies	ECON 380	Political Science
8	Art and Journalism	VART 380	Visual Arts
9	Applied Science	PHY 380	Modern Day Sensor Physics
10	Green Technologies	ENG 383	Energy Audit and Management
11	Maintenance Engineering	ENG 384	Maintenance of Electronics Equipment
12	Life Skills	HMC 380	Cooking and Nutrition
13	Environment	EVS 380	Environmental Management
14	Safety	ENG 385	Vehicle Safety
15	Quantum Computing and Technologies	ENG 394	Quantum Computing and Technologies - Part 1

Program Structure for Third Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2028-29
Semester VI

Cours e Code	Course Name	Categor y	Teaching Scheme (Contact Hours)		Credits Assigned					
			Theor y	Pract.	Theory	Pract.	Tut	Total		
CE 309	System Programming Compiler Construction	PCC	3	2	3	1	-	4		
CE 310	Machine Learning	PCC	3	2	3	1	-	4		
CE311	DevOps programming	VSEC	-	2+2#	-	2	-	2		
CE 391	Project A	ELC	-	4	-	2	-	2		
CE 3xx	Department Level Optional Course II	PEC	3	2	3	1	-	4		
CE 3xx	Department Level Optional Course III	PEC	3	2	3	1	-	4		
	IDC VI	OE (Select 1)	2	-	2	-	-	2		
Total					14	8		22		
Course Code	Course Name	Examination Scheme								
		Theory					Ex am Du rat ion (H rs)	Term Work	Pract/ Oral	Total
		Internal Assessment			End Sem Exam					
		1	2	Averag e						
CE 309	System Programming Compiler Construction	40	40	40	60	2	25	25	150	
CE 310	Machine Learning	40	40	40	60	2	25	25	150	
CE 311	DevOps programming	-	-	-	-	-	25	25	50	
CE 391	Project A	-	-	-	-	-	50	25	75	
CE 3xx	Department Level Optional Course II	40	40	40	60	2	25	25	150	
CE 3xx	Department Level Optional Course III	40	40	40	60	2	25	25	150	
	IDC VI	20	20	20	40	2	-	-	60	
Total				180	280		175	150	785	

Specializations→	Artificial Intelligence and Data Science	Cloud and Cyber Security	Robotics and Automation	Human Computer Interaction
Course Code	CE 312	CE 313	CE 314	CE 315
Department Level Optional Course II (DLOC II)	Big Data Management & Analytics	Network & Cloud Security	Robotics and Applications	User Experience Design

Specializations→	Artificial Intelligence and Data Science	Cloud and Cyber Security	Robotics and Automation	Human Computer Interaction
Course Code	CE 316	CE 317	CE 318	CE 319
Department Level Optional Course III (DLOC III)	Natural Language Processing	Ethical Hacking and Cyber Laws	Modelling and control of Intelligent systems	Usability Engineering

ILOC II - SEM VI

SN	Specialization	Course 2 (Semester VI)	
1	IP Management and Digital Business	MKT 380	Digital Business Management and Digital Marketing
2	Business Management	ENGG 386	Business Analytics
3	Bio Engineering	ENGG 387	Bio Mechanics
4	Bio Instrumentation	ENGG 388	Medical Image Processing
5	Engineering Design	DES 382	Product Design
6	Sustainable Technologies	DES 383	Technologies for Rural Development
7	Contemporary Studies	ECON 381	Economics
8	Art and Journalism	MMC 380	Journalism, Media and Communication studies
9	Applied Science	ENGG 389	Operation Research
10	Green Technologies	ENGG 390	Climate Informatics
11	Maintenance Engineering	ENGG 391	Maintenance of Mechanical Equipment
12	Life Skills	PE 380	Physical Education
13	Environment	ENGG 392	Industrial Regulations and Laws

14	Safety	ENGG 393	Industrial and high voltage Safety
15	Safety	ENGG 393	Industrial and high voltage Safety
16	Quantum Computing and Technologies	ENGG 395	Quantum Computing and Technologies - Part 2

*** : Learner will select one course from any of these ILOC verticals.**

AY 2026-27

Program Structure for Fourth Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2029-30
Semester VII

Course Code	Course Name	Category	Teaching Scheme (Contact Hours)		Credits Assigned				
			Theory	Pract.	Theory	Pract.	Tut	Total	
CE 401	Neural Computation in Deep Learning	PCC	3	2	3	1	-	4	
CE 402	Scalable Computing and Systems	PCC	3	2	3	1	-	4	
CE 403	Mobile App Development	VSEC	-	2+2#	-	2	-	2	
CE 491	Project B	ELC	-	8	-	4	-	4	
CE 4xx	Department Level Optional Course IV	PEC	3	2	3	1	-	4	
CE 4xx	Department Level Optional Course V	PEC	3	2	3	1	-	4	
Total					12	10	-	22	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Oral / Pract.	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2	Average					
CE 401	Neural Computation in Deep Learning	40	40	40	60	2	25	25	150
CE 402	Scalable Computing and Systems	40	40	40	60	2	25	25	150
CE 403	Mobile App Development	-	-	-	-	-	25	25	50
CE 491	Project B	-	-	-	-	-	25	25	50
CE 4xx	Department Level Optional Course IV	40	40	40	60	2	25	25	150
CE 4xx	Department Level Optional Course V	40	40	40	60	2	25	25	150
Total				160	240		150	150	700

Specializations→	Artificial Intelligence and Data Science	Cloud and Cyber Security	Robotics and Automation	Human Computer Interaction
Course Code	CE 404	CE 405	CE 406	CE 407
Department Level Optional Course IV (DLOC IV)	Applied Data Science	Vulnerability Assessment and Penetration Testing	Industrial Robotics and Smart Automation	Mobile and Ubiquitous Computing

Specializations→	Artificial Intelligence and Data Science	Cloud and Cyber Security	Robotics and Automation	Human Computer Interaction
Course Code	CE 408	CE 409	CE 410	CE 411
Department Level Optional Course V (DLOC V)	Social Media Analytics	Digital Forensics and Incident Response	Ethics in Robotics and Automation	Augmented Reality and Virtual Reality

Program Structure for Fourth Year
Bachelor of Technology in Computer Engineering
W.E.F. A.Y. 2029-30
Semester VIII

Course Code	Course Name	Course Component	Teaching Scheme (Contact Hours)		Credits Assigned				
			Theory	Pract.	Theory	Pract.		Total	
CE 412	Emerging Technologies & Future Computing	PCC	3	2	3	1		4	
ENGG 401	Research Methodology	Experiential Learning Courses	2	-	2	-		2	
ENGG 495	Internship	ELC	-	16		8		8	
CE 492	Project C	ELC	-	4		4		2	
					5	13		16	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract./ Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		1	2	Average					
CE 412	Emerging Technologies & Future Computing	40	40	40	60	2	25	25	150
ENGG 401	Research Methodology	20	20	20	40	2	-	-	60
ENGG 495	Internship	-	-	-	-	-	100	100	200
CE 492	Project C						50	50	100
Total				60	100		175	175	510