DEPARTMENT OF COMPUTER ENGINEERING

SECOND YEAR M. TECH. COMPUTER ENGINEERING

Curriculum

(w.e.f. Academic Year 2026-27)

PREAMBLE

The Computer Engineering programme, designed under the autonomous framework and aligned with the principles of National Education Policy 2020 and outcome-based education, aims to build a strong foundation in computing while keeping learning flexible and relevant. It blends core subjects like programming, data structures, and computer systems with modern areas such as artificial intelligence, data science, and cybersecurity. The program focuses on practical learning, projects, and real-world applications to help students develop problem-solving skills, creativity, and industry readiness. At the same time, it encourages continuous learning, ethical practices, and a sense of responsibility towards society, preparing graduates to adapt and succeed in a rapidly changing technological world.

DEPARTMENT OF COMPUTER ENGINEERING

NEP 2020 Compliant Curriculum Structure

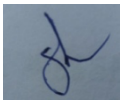
SECOND YEAR M. TECH. COMPUTER ENGINEERING

Curriculum Structure (w.e.f. Academic Year 2026-27)

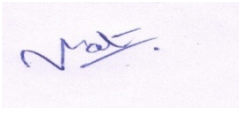
Semester - III			Teaching Scheme (Hours/Week)				Credits					Examination / Evaluation Scheme and Marks				
Course Type	Course Code	Course Title	L	T	P	SS	L	T	P	SS	Total	CCE [50]	ESE [50]	TW	PR / OR	Total
VSEC	CE-VSEC-M02-01	Dissertation Phase I	0	0	20	0	0	0	10	0	10	-	-	100	150	250
OEC	CE-OEC-M02-02	Open Elective	4	0	0	0	4	0	0	0	4	-	50	50	-	100
SLC	CE-SLC-M02-03	MOOC	0	0	0	4	0	0	0	4	4	-	50	50	-	100
AC	CE-AC-M02-04	Audit Course-Introduction to Constitution	0	0	0	2	0	0	0	0	0	-	-	-	-	-
Total			28				18					-	100	200	150	450

Semester - IV			Teaching Scheme (Hours/Week)				Credits					Examination / Evaluation Scheme and Marks				
Course Type	Course Code	Course Title	L	T	P	SS	L	T	P	SS	Total	CCE [50]	ESE [50]	TW	PR / OR	Total
VSEC	CE-VSEC-M02-05	Dissertation Phase II	0	0	28	0	0	0	14	0	14	-	-	150	200	350
Total			28				14					0	0	150	200	350

# **L** = Lecture **P** = Practical **T** = Tutorial **SS** = Self Study
CCE = Continuous and Comprehensive Evaluation **ESE** = End Semester Examination **TW** = Term work **PR/OR** = Practical/Oral



Head of the Department CE, I²IT



Principal, I²IT

SEMESTER - III

Hope Foundation's International Institute of Information Technology (I²IT), Pune

M.Tech. Computer Engineering Curriculum
With effect from A.Y. 2026-27

Dissertation Phase – I (CE- VSEC-M02-01)

Teaching Scheme:	**Credits: 10**	**Examination Scheme:**
Practical: 20 Hrs/ Week		**Term work:** 100 Marks **Oral:** 150 Marks

Course Introduction :

Dissertation Phase I marks the beginning of a systematic research or development project undertaken by postgraduate students under faculty supervision. In this phase, students are expected to identify a research problem relevant to their domain, perform an extensive literature review, define research objectives, and propose a methodology. The focus is on problem formulation, initial experimentation or design, and preparing a detailed project proposal and progress report. This phase lays the foundation for Dissertation Phase II, where full implementation and evaluation are carried out.

Course Objectives:

- To enable students to identify and define a relevant research or development problem in the field of computer engineering.
- To develop skills in reviewing scholarly literature and identifying research gaps.
- To formulate clear research objectives and design an appropriate methodology.
- To initiate preliminary work such as experimentation, simulation, or system design based on the proposed approach.
- To enhance technical communication skills through effective documentation and presentations.

Course Outcomes:

On the completion of Dissertation Phase I, students will be able to:
VSEC-CO-M19.1: Identify a relevant and feasible research problem based on literature review and current trends.
VSEC-CO-M19.2: Formulate research objectives, scope, and methodology aligned with the identified problem.
VSEC-CO-M19.3: Conduct preliminary investigations or design components of the proposed system/solution.
VSEC-CO-M19.4: Demonstrate effective research planning, time management, and progress tracking.
VSEC-CO-M19.5: Prepare a well-structured dissertation proposal and present findings with clarity and technical rigor.

Guidelines

- Dissertation work may be in-house research, sponsored or multidisciplinary. It can be carried out inside or outside the institute, in any relevant industry/organization or research institution or labs/organization.
- Each student must undertake the dissertation work individually.
- Students are expected to identify a research area or topic aligned with current trends and advancements, in consultation with their assigned faculty guide, industry experts, or research organizations.
- Regular interaction with the project guide is mandatory. Students should meet their guides at least once a week to discuss progress and receive feedback.
- A project diary must be maintained, documenting meeting notes, guide/reviewer feedback, and the overall progress. This diary is to be presented during every review session.
- Students must adhere to ethical research practices, maintain academic integrity, and properly acknowledge sources when referring to existing work.
- For the final evaluation, students are required to submit a comprehensive and approved dissertation report within the specified deadline.
- The report must be prepared individually by the student, reviewed and approved by the guide, and submitted with all required signatures.
- Students are also encouraged to extend their dissertation outcomes into a research paper, funding proposal, patent, or copyright, and aim to submit it to reputed journals or conferences in collaboration with their guide.

Deliverables

- Dissertation Synopsis having following details: Abstract, Problem statement, Requirements specification, Literature survey, Proposed solution, High level design description, Plan for implementation and testing in Phase-II
- Review-1 and Review-2 Reports
- Draft of the Research Article
- A presentation that covers the major points covered in the report.

Assessment Criteria

- **Review Structure:** The assessment process will consist of two formal review stages, scheduled at regular intervals throughout the Dissertation Phase I.
- **Project Title Approval:** The dissertation title will be finalized and approved by the review committee during the initial review. Students may be required to deliver a presentation or participate in a discussion covering the scope and contents outlined in the project synopsis.
- **Progress Evaluation:** The project guide and/or review committee will monitor and evaluate the timely progress of the dissertation work at each review stage.
- **Assessment Rubrics:** Evaluation will be conducted based on standardized rubrics. These rubrics detail the performance indicators and expectations for each review phase.
- **Demonstration of Progress:** Students must clearly demonstrate the developments and improvements made since the previous review during each subsequent evaluation.
- **Incorporation of Feedback:** All feedback, suggestions, or corrections provided by the review panel must be properly documented in the project diary. Students are expected to implement the suggestions and present the revised work in subsequent reviews.
- **Term Work Evaluation:** The final term work marks for Dissertation Phase I will be determined

based on cumulative performance across all reviews.

- **Final Examination:** At the end of Phase I, students will appear for a viva-voce examination conducted by an external examiner, where they will defend the progress and findings of their dissertation work.

CO PO Mapping

CO\PO	PO1	PO2	PO3	PSO1	PSO2	PSO3
VSEC-CO-M19.1	3	2	3	2	2	3
VSEC-CO-M19.2	3	2	3	3	2	3
VSEC-CO-M19.3	3	2	2	3	3	3
VSEC-CO-M19.4	2	2	2	2	2	3
VSEC-CO-M19.5	2	2	2	2	2	3

Hope Foundation's International Institute of Information Technology (I²IT), Pune
M.Tech. Computer Engineering Curriculum
With effect from A.Y. 2026-27

Open Elective (MOOC Online Courses) (CE-OEC-M02-02)

Teaching Scheme:	Credits: 04	Examination Scheme:
Self Study: 04 Hrs/ Week		**Termwork :** 50 Marks **ESE**: 50 Marks

Course Objectives:

- To broaden the interdisciplinary knowledge base of computer engineering students by exposing them to applications in emerging or allied domains.
- To develop the ability to integrate computing principles with domain-specific challenges in areas such as life sciences, finance, or management.

Course Outcomes:

OEC-CO-M20.1: Demonstrate an understanding of fundamental concepts and terminology of the chosen interdisciplinary domain.

OEC-CO-M20.2: Analyze and interpret domain-specific problems using appropriate computational or analytical tools.

OEC-CO-M20.3: Apply computing and engineering principles to design or enhance solutions in the interdisciplinary context.

List of Suggested Courses

CE-OEC-M02-02(A): (Bioinformatics) Bioinformatics: Algorithms and Applications By Prof. Michael Gromiha, IIT Madras
https://onlinecourses.nptel.ac.in/noc21_bt06/preview

CE-OEC-M02-02 (B): (Finance) Artificial Intelligence (AI) for Investments By Prof. Abhinava Tripathi, IIT Kanpur
https://onlinecourses.nptel.ac.in/noc23_mg63/preview

CE-OEC-M02-02(C): (Management) AI for Product Management (3 Course Series) by Duke University, Coursera
https://www.coursera.org/specializations/ai-product-management-duke

Guidelines for Course Selection

1. Students must obtain prior approval from their Mentor/Project Guide and the PG Coordinator or MOOC Coordinator by submitting the duly filled MOOC Course Approval Form.
2. Students must submit proof of course registration done along with MOOC Course Approval Form
3. Certification and grade report is mandatory for the course to be selected
4. Students must complete all assessments related to the selected course as prescribed by the course and guide/ mentor

Course Assessment

At the end of course submission, the MOOC report of 10-15 pages in hardcopy is mandatory along with certificate of completion

Hope Foundation's International Institute of Information Technology (I²IT), Pune
M.Tech. Computer Engineering Curriculum
With effect from A.Y. 2026-27

MOOC – (CE-SLC-M02-03)

Teaching Scheme:	**Credits: 04**	**Examination Scheme:**
Self Study: 04 Hrs/ Week		**Termwork :** 50 Marks **ESE**: 50 Marks

Course Introduction:

This course allows students to explore and gain foundational to intermediate knowledge in emerging technological domains through approved online MOOC platforms. Students can choose from specialized courses aligning with their research interests or career goals. The objective is to promote self-paced learning, interdisciplinary skills, and awareness of cutting-edge trends in computing and innovation.

Course Objectives:

- To enable students to independently acquire knowledge and skills in emerging or interdisciplinary areas through self-paced, structured learning.
- Gain conceptual and technical understanding of a selected emerging technology.

Course Outcomes:

On completion of the course students will be able to

SLC-CO-M20.1: Demonstrate conceptual understanding of the core principles and tools of the selected MOOC subject.

SLC-CO-M20.2: Demonstrate self-learning and technical reporting skills through completion of MOOC and reflective assignments/presentations.

List of Suggested Courses

1. Foundations of Virtual Reality - By Prof. M. Manivannan, Prof. Anna Lavalle, Prof. Steven Lavalle, IIT Madras, University of Oulu https://onlinecourses.nptel.ac.in/noc25_cs87/preview
2. Introduction to Industry 4.0 and Industrial Internet of Things - By Prof. Sudip Misra, IIT Kharagpur https://onlinecourses.nptel.ac.in/noc21_cs20/preview
3. Blockchain Architecture Design and Use Cases – By Prof. Sandip Chakraborty, Praveen Jayachandran, IIT Madras https://nptel.ac.in/courses/106105184
4. Statistical Learning for Reliability Analysis - By Prof. Monalisa Sarma, IIT Kharagpur https://onlinecourses.nptel.ac.in/noc25_cs139/preview
5. Social Network Analysis - By Prof. Tanmoy Chakraborty, IIT Delhi https://onlinecourses.nptel.ac.in/noc25_cs100/preview
6. Introduction to Quantum Computing: Quantum Algorithms and Qiskit,– By Prof. Prabha Mandayam, Prof. Anupama Ray, Prof. Sheshashayee Raghunathan https://onlinecourses.nptel.ac.in/noc25_cs95/preview

Guidelines for Course Selection

1. Students must obtain prior approval from their Mentor/Project Guide and the PG Coordinator or MOOC Coordinator by submitting the duly filled MOOC Course Approval Form.
2. Students must submit proof of course registration done along with MOOC Course Approval Form
3. Certification and grade report is mandatory for the course to be selected

   Students must complete all assessments related to the selected course as prescribed by the course and guide/ mentor

Course Assessment

At the end of course submission, the MOOC report of 10-15 pages in hardcopy is mandatory along with certificate of completion

SEMESTER - IV

Hope Foundation's International Institute of Information Technology (I²IT), Pune
M.Tech. Computer Engineering Curriculum
With effect from A.Y. 2026-27

Dissertation Phase – II (CE-VSEC-M02-04)

Teaching Scheme:	**Credits: 14**	**Examination Scheme:**
Practical: 28 Hrs/ Week		**Term work:** 150 Marks **Oral:** 200 Marks

Course Introduction:

Dissertation Phase II is the culmination of the postgraduate research project that began in Phase I. In this phase, students are expected to complete the full research cycle—from implementation to evaluation—under the guidance of a faculty mentor. The work should demonstrate technical depth, innovation, and a clear contribution to the domain. It results in a detailed dissertation report, a research article/paper, and an open defense before an academic panel.

Course Objectives:

- To carry forward the proposed research plan into full-scale implementation and evaluation.
- To encourage critical thinking and problem-solving in the domain of computer engineering.
- To develop skills in technical writing, analysis, and oral presentation.
- To contribute original ideas, methods, or systems to the chosen field.
- To adhere to research ethics and academic integrity in reporting and publishing work.

Course Outcomes:

Upon successful completion, the student will be able to:
VSEC-CO-M21.1: Apply appropriate methodologies to implement and validate the proposed research work.
VSEC-CO-M21.2: Analyze and interpret results using theoretical and practical knowledge in the field.
VSEC-CO-M21.3: Prepare a well-structured and technically sound dissertation report.
VSEC-CO-M21.4: Present research findings effectively through oral defense and written documentation.
VSEC-CO-M21.5: Demonstrate ethical research conduct and contribute to scholarly publications.

Guidelines

- **Continuation from Phase I:** Work should build upon the approved project from Phase I and incorporate suggestions from the review panel.
- **Weekly Reviews:** Students must meet their guides regularly (at least once a week) and update progress. Key decisions and feedback should be recorded in the Project Diary.
- **Implementation & Validation:** The core development and validation phase should be completed during this semester. Techniques used should be appropriately justified and benchmarked.
- **Report Submission:** The final report must follow the standard institutional format and include an abstract, literature review, methodology, implementation details, results, conclusion, and references.
- **Publication Requirement:** It is expected that students prepare and submit at least one research article, technical paper, funding proposal, or IP filing (patent/copyright) in consultation with

their guide.

- **Plagiarism Check:** Reports must pass a plagiarism check and maintain academic integrity throughout.

Deliverables

1. **Complete Implementation of Research Work:** Execution of the proposed methodology including system design, modeling, experimentation, algorithm development, or prototype creation.
2. **Evaluation and Result Analysis:** Validation of results using appropriate metrics, tools, or benchmarks with critical interpretation of findings.
3. **Final Dissertation Report:** A comprehensive report adhering to the institutional format including abstract, literature review, methodology, results, discussion, conclusion, and references. Must include plagiarism certificate as per institute norms.
4. **Project Diary / Logbook:** Record of weekly meetings, guidance received, feedback from reviews, and milestones achieved during the course of the dissertation.
5. **Research Publication / Article / IP Filing:** At least one research output in the form of a paper submitted to a peer-reviewed journal/conference or a patent/copyright/IP application prepared with the supervisor.
6. **Final Oral Presentation / Viva:** A formal presentation and defense of the dissertation work before an evaluation panel consisting of internal and external examiners.

Assessment Criteria

Dissertation Phase II will be evaluated by a panel of examiners, including at least one external expert. Students are expected to validate their research by publishing it in recognized journals or conferences. Regular updates, presentations, and proper documentation of progress are required and will be monitored by the PG coordinator. All progress must be clearly recorded. Students should follow the guidelines and formats given in the department-approved Dissertation Workbook.

CO PO Mapping

CO\PO	PO1	PO2	PO3	PSO1	PSO2	PSO3
VSEC-CO-M21.1	3	2	3	3	2	3
VSEC-CO-M21.2	3	2	3	3	2	3
VSEC-CO-M21.3	2	3	3	2	2	2
VSEC-CO-M21.4	2	3	3	2	2	2
VSEC-CO-M21.5	3	3	2	2	2	3