

B.E. Computer Science and Engineering Curriculum



A comprehensive semester-wise breakdown of courses offered in the B.E. Computer Science and Engineering programme at Er. Perumal Manimekalai College of Engineering, following the Regulations 2023 (R23) curriculum structure from Semester I to VIII.

Foundation Semesters: Building the Base

Semester I

- Professional English - I
- Matrices and Calculus
- Engineering Physics
- Engineering Chemistry
- Engineering Graphics
- Heritage of Tamils
- Physics and Chemistry Laboratory
- Wellness

Total Credits: 21

Semester II

- Professional English-II
- Statistics and Numerical Methods
- Physics for Information Science
- Basic Electrical & Electronics Engineering
- Fundamentals of Computer Science
- Problem Solving using Python Programming
- Tamils and Technology
- Civil and Mechanical Engineering Practices

Total Credits: 24

The first two semesters establish a strong foundation in mathematics, sciences, and basic engineering principles whilst introducing students to computer science fundamentals and programming concepts.

Core Development Phase: Semesters III & IV

Semester III Courses

- Mathematics for Computer Science and Engineering
- Computer Organization and Architecture
- Foundations of Data Science
- Data Structures and Algorithms
- Object Oriented Programming
- Data Science Laboratory
- Object Oriented Programming Laboratory
- Extension Activities
- Mandatory Course - I (Non-Credit)

Total Credits: 22

Semester IV Courses

- Environmental Science & Sustainability
- Operating Systems
- Artificial Intelligence and Machine Learning
- Database Management Systems
- Software Engineering
- Operating Systems Laboratory
- Database Management Systems Laboratory
- AI and Machine Learning Laboratory
- Mandatory Course - II
- In-plant Training

Total Credits: 21

These semesters introduce core computer science subjects including data structures, programming paradigms, and fundamental system concepts that form the backbone of computer engineering knowledge.

Specialisation Begins: Semester V

01

Core Subjects

Universal Human Values & Ethics, Computer Networks, and Theory of Computation provide essential theoretical foundations.

03

Practical Implementation

Computer Network Laboratory and Software Engineering Laboratory provide hands-on experience with networking protocols and software development methodologies.

Complete Course List: Universal Human Values & Ethics, Computer Networks, Theory of Computation, Professional Elective - I, Professional Elective - II, Industry Lecture-I, Computer Network Laboratory, Software Engineering Laboratory, Professional Development-I, In-plant Training

Total Credits: 21

02

Professional Electives

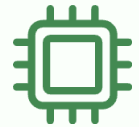
Students begin choosing specialisation areas through Professional Elective - I and Professional Elective - II courses.

04

Professional Development

Industry Lecture-I and Professional Development-I courses bridge academic learning with industry requirements.

Advanced Specialisation: Semester VI



Compiler Design

Students learn the principles and techniques of compiler construction, including lexical analysis, parsing, and code generation.



Embedded Systems and IoT

Comprehensive coverage of embedded programming, Arduino, Raspberry Pi, and Internet of Things applications.



Professional Electives

Professional Elective - III and IV allow deeper specialisation in chosen areas of computer science.



Open Electives

Open Elective - I and II provide interdisciplinary learning opportunities, including management verticals.

Complete Course List: Compiler Design, Embedded Systems and IoT, Professional Elective - III, Professional Elective - IV, Open Elective - I, Open Elective - II, Industry Lecture - II, Compiler Design Laboratory, Professional Development -II, Technical Skill Development-I, In-plant Training

Total Credits: 23

Security and Project Phase: Semester VII



Cryptography and Cyber Security

Advanced security concepts including encryption algorithms, network security, and cyber threat analysis.



Professional Electives V & VI

Final specialisation choices allowing students to focus on their preferred career paths.



Project Phase – I

Beginning of capstone project work, applying learned concepts to real-world problems.

Complete Course List: Cryptography and Cyber Security, Professional Elective - V, Professional Elective - VI, Open Elective - III, Open Elective - IV, Security Laboratory, Technical Skill Development -II, In-plant Training, Project Phase -I

Total Credits: 22

Capstone Experience: Semester VIII



Project Phase – II

The entire eighth semester is dedicated to completing the capstone project, allowing students to demonstrate their comprehensive understanding of computer science and engineering principles.

- 20 contact periods per week
- 10 credits total
- Mandatory project work
- Optional 3-6 months internship

This intensive project phase enables students to apply theoretical knowledge to practical problems, develop research skills, and prepare for professional careers or advanced studies. The optional internship component provides valuable industry experience.

Mandatory Courses: Holistic Development

Mandatory Courses - I (Semester III)

- Women and Gender Studies
- Elements of Literature
- Film Appreciation
- The Constitution of India

Mandatory Courses - II (Semester IV)

- Practices for Well Being
- Indian History of Science and Technology
- Political and Economic Thought for a Humane Society
- Sociology, Society and Culture

These non-credit mandatory courses ensure well-rounded development by exposing students to humanities, social sciences, and cultural studies alongside their technical education. Students must choose one course from each category during the respective semesters.

Credit Distribution and Programme Structure

164

Total Credits

Required for degree completion

62

Professional Core

Core computer science subjects

18

Professional Electives

Specialisation courses

26

Basic Sciences

Mathematics and science foundation



Programme Outcomes and Career Readiness

Technical Excellence

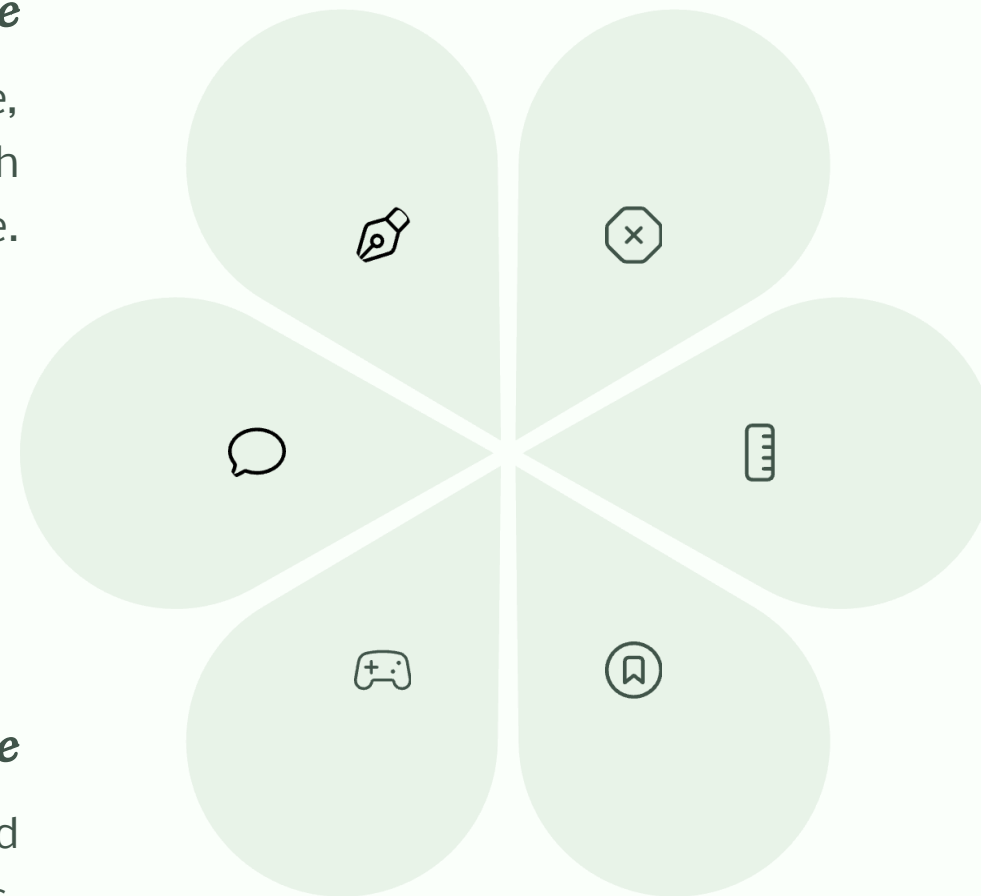
Strong foundation in mathematics, science, and engineering fundamentals with specialisation in computer science.

Professional Skills

Effective communication, teamwork, project management, and lifelong learning capabilities.

Modern Tool Usage

Proficiency in contemporary engineering and IT tools for complex activities.



Problem Analysis

Ability to identify, formulate, and solve complex engineering problems using first principles.

Solution Design

Capability to design solutions for complex problems considering societal and environmental factors.

Investigation Skills

Research-based knowledge and methods including experimentation and data analysis.

The comprehensive eight-semester curriculum prepares graduates for successful careers in software development, system design, research, and entrepreneurship whilst instilling ethical values and social responsibility. The programme's emphasis on practical learning through laboratories, projects, and industry training ensures graduates are industry-ready and capable of contributing meaningfully to technological advancement.