



VIT[®]
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

School of Computer Science and Engineering

CURRICULUM AND SYLLABI

(2024-2025)

B. Tech. Computer Science and Engineering

(CyberSecurity)



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School of Computer Science and Engineering

B.Tech. Computer Science and Engineering (Cyber Security)

VISION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

Transforming life through excellence in education and research.

MISSION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

World class Education: Excellence in education, grounded in ethics and critical thinking, for improvement of life.

Cutting edge Research: An innovation ecosystem to extend knowledge and solve critical problems.

Impactful People: Happy, accountable, caring and effective workforce and students.

Rewarding Co-creations: Active collaboration with national & international industries & universities for productivity and economic development.

Service to Society: Service to the region and world through knowledge and compassion.



School of Computer Science and Engineering

B.Tech. Computer Science and Engineering (Cyber Security)

VISION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

To be a world-renowned centre of education, research and service in computing and allied domains.

MISSION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

- To offer computing education programs with the goal that the students become technically competent and develop lifelong learning skill.
- To undertake path-breaking research that creates new computing technologies and solutions for industry and society at large.
- To foster vibrant outreach programs for industry, research organizations, academia and society.



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School of Computer Science and Engineering

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. Graduates will be engineering practitioners and leaders, who would help solve industry's technological problems.
2. Graduates will be engineering professionals, innovators or entrepreneurs engaged in technology development, technology deployment, or engineering system implementation in industry.
3. Graduates will function in their profession with social awareness and responsibility.
4. Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.
5. Graduates will be successful in pursuing higher studies in engineering or management.
6. Graduates will pursue career paths in teaching or research.



School of Computer Science and Engineering

B.Tech. Computer Science and Engineering (Cyber Security)

PROGRAMME OUTCOMES (POs)

PO_01: Having an ability to apply mathematics and science in engineering applications.

PO_02: Having a clear understanding of the subject related concepts and of contemporary issues and apply them to identify, formulate and analyse complex engineering problems.

PO_03: Having an ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment.

PO_04: Having an ability to design and conduct experiments, as well as to analyse and interpret data, and synthesis of information.

PO_05: Having an ability to use techniques, skills, resources and modern engineering and IT tools necessary for engineering practice.

PO_06: Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems.

PO_07: Having adaptive thinking and adaptability in relation to environmental context and sustainable development.

PO_08: Having a clear understanding of professional and ethical responsibility.

PO_09: Having cross cultural competency exhibited by working as a member or in teams.

PO_10: Having a good working knowledge of communicating in English– communication with engineering community and society.

PO_11: Having a good cognitive load management skills related to project management and finance.

PO_12: Having interest and recognise the need for independent and lifelong learning.



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PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Apply cybersecurity principles to analyse the security needs of an organisation.

PSO2 : Develop skills to mitigate cyber risks and vulnerabilities in real-world scenarios.

PSO3 : Comply with cybersecurity standards and use technologies to secure systems and applications.



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School of Computer Science and Engineering

B.Tech. Computer Science and Engineering (Cyber Security)

CREDIT STRUCTURE

| CREDIT INFORMATION | | |
|---------------------------|--|----------------|
| S.no | Category | Credits |
| 1 | Foundation Core | 53 |
| 2 | Discipline-linked Engineering Sciences | 12 |
| 3 | Discipline Core | 47 |
| 4 | Specialization Elective | 21 |
| 5 | Projects and Internship | 9 |
| 6 | Open Elective | 9 |
| 7 | Bridge Course | 0 |
| 8 | Non-graded Core Requirement | 11 |
| Total Credits | | 162 |

| Foundation Core | | | | | | | | | |
|-----------------|-------------|--|-------------------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BCHY101L | Engineering Chemistry | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 2 | BCHY101P | Engineering Chemistry Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 3 | BCSE101E | Computer Programming: Python | Embedded Theory and Lab | 1.0 | 1 | 0 | 4 | 0 | 3.0 |
| 4 | BCSE102L | Structured and Object-Oriented Programming | Theory Only | 1.0 | 2 | 0 | 0 | 0 | 2.0 |
| 5 | BCSE102P | Structured and Object-Oriented Programming Lab | Lab Only | 1.0 | 0 | 0 | 4 | 0 | 2.0 |
| 6 | BCSE103E | Computer Programming: Java | Embedded Theory and Lab | 1.0 | 1 | 0 | 4 | 0 | 3.0 |
| 7 | BEEE102L | Basic Electrical and Electronics Engineering | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 8 | BEEE102P | Basic Electrical and Electronics Engineering Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 9 | BENG101L | Technical English Communication | Theory Only | 1.0 | 2 | 0 | 0 | 0 | 2.0 |
| 10 | BENG101P | Technical English Communication Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 11 | BENG102P | Technical Report Writing | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 12 | BFLE200L | B.Tech. Foreign Language - 2021 onwards | Basket | 1.0 | 0 | 0 | 0 | 0 | 2.0 |
| 13 | BHSM200L | B.Tech. HSM Elective - 2021 onwards | Basket | 1.0 | 0 | 0 | 0 | 0 | 3.0 |
| 14 | BMAT101L | Calculus | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 15 | BMAT101P | Calculus Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 16 | BMAT102L | Differential Equations and Transforms | Theory Only | 1.0 | 3 | 1 | 0 | 0 | 4.0 |
| 17 | BMAT201L | Complex Variables and Linear Algebra | Theory Only | 1.0 | 3 | 1 | 0 | 0 | 4.0 |
| 18 | BMAT202L | Probability and Statistics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 19 | BMAT202P | Probability and Statistics Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 20 | BPHY101L | Engineering Physics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 21 | BPHY101P | Engineering Physics Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 22 | BSTS101P | Quantitative Skills Practice I | Soft Skill | 1.0 | 0 | 0 | 3 | 0 | 1.5 |
| 23 | BSTS102P | Quantitative Skills Practice II | Soft Skill | 1.0 | 0 | 0 | 3 | 0 | 1.5 |
| 24 | BSTS201P | Qualitative Skills Practice I | Soft Skill | 1.0 | 0 | 0 | 3 | 0 | 1.5 |
| 25 | BSTS202P | Qualitative Skills Practice II | Soft Skill | 1.0 | 0 | 0 | 3 | 0 | 1.5 |

| Discipline-linked - Engineering Sciences | | | | | | | | | |
|--|-------------|--|-------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BECE102L | Digital Systems Design | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 2 | BECE102P | Digital Systems Design Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 3 | BECE204L | Microprocessors and Microcontrollers | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 4 | BECE204P | Microprocessors and Microcontrollers Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 5 | BMAT205L | Discrete Mathematics and Graph Theory | Theory Only | 1.0 | 3 | 1 | 0 | 0 | 4.0 |

| Discipline Core | | | | | | | | | |
|-----------------|-------------|--|-------------------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BCSE202L | Data Structures and Algorithms | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 2 | BCSE202P | Data Structures and Algorithms Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 3 | BCSE203E | Web Programming | Embedded Theory and Lab | 1.0 | 1 | 0 | 4 | 0 | 3.0 |
| 4 | BCSE204L | Design and Analysis of Algorithms | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 5 | BCSE204P | Design and Analysis of Algorithms Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 6 | BCSE205L | Computer Architecture and Organization | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 7 | BCSE301L | Software Engineering | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 8 | BCSE301P | Software Engineering Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 9 | BCSE302L | Database Systems | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 10 | BCSE302P | Database Systems Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 11 | BCSE303L | Operating Systems | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 12 | BCSE303P | Operating Systems Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 13 | BCSE304L | Theory of Computation | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 14 | BCSE305L | Embedded Systems | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 15 | BCSE306L | Artificial Intelligence | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 16 | BCSE308L | Computer Networks | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 17 | BCSE308P | Computer Networks Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 18 | BCSE309L | Cryptography and Network Security | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 19 | BCSE309P | Cryptography and Network Security Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 20 | BCSE338L | Fundamentals of Cyber Security | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 21 | BCSE338P | Fundamentals of Cyber Security Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |

| Specialization Elective | | | | | | | | | |
|-------------------------|-------------|--|-------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BCSE340L | Penetration Testing and Vulnerability Assessment | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 2 | BCSE340P | Penetration Testing and Vulnerability Assessment Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 3 | BCSE437L | Cybercrimes and Forensics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 4 | BCSE437P | Cybercrimes and Forensics Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 5 | BCSE438L | Malware Analysis and Mitigation Techniques | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 6 | BCSE438P | Malware Analysis and Mitigation Techniques Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 7 | BCSE439L | DevOps Security | Theory Only | 1.0 | 2 | 0 | 0 | 0 | 2.0 |
| 8 | BCSE439P | DevOps Security Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 9 | BCSE440L | System Security | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 10 | BCSE341L | Enterprise Security | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 11 | BCSE441L | AI for Cybersecurity | Theory Only | 1.0 | 2 | 0 | 0 | 0 | 2.0 |
| 12 | BCSE441P | AI for Cybersecurity Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |
| 13 | BCSE442L | Cyber Threat Intelligence | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 14 | BCSE307L | Compiler Design | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 15 | BCSE307P | Compiler Design Lab | Lab Only | 1.0 | 0 | 0 | 2 | 0 | 1.0 |

| Projects and Internship | | | | | | | | | |
|-------------------------|-------------|------------------------------|-------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BCSE399J | Summer Industrial Internship | Project | 1.0 | 0 | 0 | 0 | 0 | 1.0 |
| 2 | BCSE497J | Project - I | Project | 1.0 | 0 | 0 | 0 | 0 | 3.0 |
| 3 | BCSE498J | Project - II / Internship | Project | 1.0 | 0 | 0 | 0 | 0 | 5.0 |
| 4 | BCSE499J | One Semester Internship | Project | 1.0 | 0 | 0 | 0 | 0 | 14.0 |

| Open Elective | | | | | | | | | |
|---------------|-------------|------------------------------------|-------------------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BECE320E | Embedded C Programming | Embedded Theory and Lab | 1.0 | 2 | 0 | 2 | 0 | 3.0 |
| 2 | BHUM201L | Mass Communication | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 3 | BHUM202L | Rural Development | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 4 | BHUM203L | Introduction to Psychology | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 5 | BHUM204L | Industrial Psychology | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 6 | BHUM205L | Development Economics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 7 | BHUM206L | International Economics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 8 | BHUM207L | Engineering Economics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 9 | BHUM208L | Economics of Strategy | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 10 | BHUM209L | Game Theory | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 11 | BHUM210E | Econometrics | Embedded Theory and Lab | 1.0 | 2 | 0 | 2 | 0 | 3.0 |
| 12 | BHUM211L | Behavioral Economics | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 13 | BHUM212L | Mathematics for Economic Analysis | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 14 | BHUM213L | Corporate Social Responsibility | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 15 | BHUM214L | Political Science | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 16 | BHUM215L | International Relations | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 17 | BHUM216L | Indian Culture and Heritage | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 18 | BHUM217L | Contemporary India | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 19 | BHUM218L | Financial Management | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 20 | BHUM219L | Principles of Accounting | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 21 | BHUM220L | Financial Markets and Institutions | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |

| | | | | | | | | | |
|----|----------|---|-------------|-----|---|---|---|---|-----|
| 22 | BHUM221L | Economics of Money, Banking and Financial Markets | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 23 | BHUM222L | Security Analysis and Portfolio Management | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 24 | BHUM223L | Options , Futures and other Derivatives | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 25 | BHUM224L | Fixed Income Securities | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 26 | BHUM225L | Personal Finance | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 27 | BHUM226L | Corporate Finance | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 28 | BHUM227L | Financial Statement Analysis | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 29 | BHUM228L | Cost and Management Accounting | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 30 | BHUM229L | Mind, Embodiment and Technology | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 31 | BHUM230L | Health Humanities in Biotechnological Era | Theory Only | 1.0 | 3 | 0 | 0 | 0 | 3.0 |
| 32 | BSTS301P | Advanced Competitive Coding - I | Soft Skill | 1.0 | 0 | 0 | 3 | 0 | 1.5 |
| 33 | BSTS302P | Advanced Competitive Coding - II | Soft Skill | 1.0 | 0 | 0 | 3 | 0 | 1.5 |

| Bridge Course | | | | | | | | | |
|---------------|-------------|---------------------------------|-------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BENG101N | Effective English Communication | Lab Only | 1.0 | 0 | 0 | 4 | 0 | 2.0 |

| Non-graded Core Requirement | | | | | | | | | |
|-----------------------------|-------------|---|---------------|---------|---|---|---|---|---------|
| sl.no | Course Code | Course Title | Course Type | Version | L | T | P | J | Credits |
| 1 | BCHY102N | Environmental Sciences | Online Course | 1.0 | 0 | 0 | 0 | 0 | 2.0 |
| 2 | BCSE101N | Introduction to Engineering | Project | 1.0 | 0 | 0 | 0 | 0 | 1.0 |
| 3 | BEXC100N | Extracurricular Activities / Co-Curricular Activities -B.Tech. Programmes | Basket | 1.0 | 0 | 0 | 0 | 0 | 2.0 |
| 4 | BHUM101N | Ethics and Values | Online Course | 1.0 | 0 | 0 | 0 | 0 | 2.0 |
| 5 | BSSC101N | Essence of Traditional Knowledge | Online Course | 1.0 | 0 | 0 | 0 | 0 | 2.0 |
| 6 | BSSC102N | Indian Constitution | Online Course | 1.0 | 0 | 0 | 0 | 0 | 2.0 |