

<u>Preamble</u>

This Master's program is designed to equip students with a well-rounded skill set in both theoretical and applied aspects of computer science. It spans **six semesters**, each offering a blend of foundational knowledge, specialized coursework, and hands-on projects.

- 1. **Semesters 1 & 2** introduce **core concepts** in mathematics, electronics, logic, and basic programming. Students also develop key communication skills (English/French) and learn the fundamentals of professional environments (business management, financial basics). Early project modules encourage active learning and teamwork.
- 2. **Semesters 3 & 4** build on these foundations with **more advanced topics** in software design, embedded systems, database management, optimization, and system architecture. Students gain exposure to real-world development methodologies (agile, hardware design) and begin preparing for industry-recognized certifications (LPI, CCNA and DELF), enhancing their professional competitiveness.
- 3. **Semester 5** delves into **cutting-edge domains** such as big data, cloud computing, machine learning, and software quality assurance. Emphasis is placed on large-scale data processing, service-oriented engineering, and robust software/system security. Students continue to refine their soft skills (business communication, project management) and their French/English proficiency, targeting professional certifications (ISTQB).
- 4. **Semester 6** culminates in an extended **professional traineeship**, allowing students to apply their accumulated knowledge in real industry settings or research projects. Through one or two short internships and a final research project, they address genuine business or technical challenges, produce a dissertation, and demonstrate mastery in their chosen specialty.

Overall, this **six-semester program** offers a comprehensive curriculum that seamlessly integrates theoretical foundations with practical applications. Graduates emerge as highly adaptable professionals and innovators, ready to tackle complex problems in software engineering, networking, data analytics, and beyond.





Module Title	Module Descriptions for	Semester 1			
	Code: CSE110	Hourly volume: 195	Credit:7.5		
Fundamental and Applied Mathematics	 Objective: Provide essential mathematical tools to analyze and solve complex problems in engineering and computer science. Submodules: CSE111 – Engineering Mathematics: Covers signals and systems, Fourier transforms, distributions, and linear time-invariant (LTI) systems. CSE112 – Applied Probabilities and Statistics: Focus on descriptive statistics, data visualization, measures of central tendency and dispersion, correlation, and regression. 				
	Code: CSE120	Hourly volume: 117	Credit :4.5		
Electronics	 Objective: Deliver a solid foundation in analog and digital electronics relevant to computing and embedded systems. Submodules: CSE121 – Analog Electronics: Explores semiconductors, amplifiers, Op-Amps, and analog signal processing. CSE122 – Digital Circuits: Includes logic gates, Boolean algebra, combinational/sequential circuits, flip-flops, multiplexers, and memory units. 				
	Code: CSE130 Hourly volume: 156 Credit :6				
Algorithm & Programming	 Objective: To provide students with the fundamental principles of algorithmic thinking and programming. The focus is on mastering algorithm design, understanding data structures, and gaining practical experience through coding exercises and project-based learning. Submodules: CSE131 – Algorithm and Data Structures: Covers algorithm development, recursion, complexity analysis, and implementation of core data structures such as stacks, queues, lists, trees, and graphs. CSE132 – Programming Workshop: Focused on hands-on programming in C/C++, emphasizing logic, debugging, structured programming, and solving algorithmic challenges. 				



Module Title	Module Descriptions for Semester 1					
	Code: CSE140 Hourly volume: 156 Credit : 6					
Logic and Analysis	 Objective: To introduce students to formal logic systems and algorithmic approaches in numerical problem-solving. This module strengthens students' reasoning abilities and equips them with mathematical tools to model and solve engineering problems. Submodules: CSE141 – Formal Logic: Explores propositional and predicate logic, logical operators, truth tables, inference techniques, and formal proof methods. CSE142 – Algorithms for Numerical Analysis: Focuses on designing and implementing numerical methods (e.g., root finding, interpolation, numerical integration) with an emphasis on algorithmic solutions. 					
	Code: LAC150	Hourly volume: 117	Credit :4.5			
	> Objective: Equip st	> Objective: Equip students with communication skills in English and				
Languages and cultures I	 French relevant to academic and professional contexts, and introduce them to economic and managerial fundamentals. Submodules: LAC151 – English I: English for Computer Science I: Focus on reading, writing, listening, and speaking skills tailored to computer science contexts (e.g., technical vocabulary, documentation, presentations). LAC152 – French I: Communication Technique & Preparation for DELF B1: Develops formal written and oral communication in French, oriented towards professional and academic settings. Prepares students for the DELF B1 certification. LAC153 – Economics and Business Management: Introduces basic concepts in micro/macro-economics, business structures, and management principles relevant to engineers and future tech entrepreneurs. 					
	Code: CSE160	Hourly volume: 39	Credit :1.5			
Project I	 Objective: Introduce students to project-based learning by applying foundational knowledge from various modules to solve a guided technical problem. Submodule: CSE161 – Supervised Project I: A hands-on, Teacher-supervised project where students collaboratively design and implement a basic solution to a computing or engineering-related problem. Emphasis is placed on problem analysis, planning, teamwork, reporting, and presentation skills. 					





Module Code	Module Descriptions for Semester 2			
	Code: CSE210	Hourly volume: 156	Credit: 6	
Theory and Optimization	 Objective: Provide students with solid theoretical tools to model, analyze, and optimize computational problems through algorithm design, language theory, and graph-based techniques. Submodules: CSE211 – Language Theory and Compilation: Study of formal languages, automata, grammars, and compiler basics (lexical/syntax analysis, parsing, code generation). CSE212 – Graph Theory and Optimization: Core graph algorithms: shortest paths, spanning trees, flows, and optimization problems applied to real-world systems. 			
	Code: CSE220	Hourly volume: 195	Credit:7.5	
Programming & web multimedia	 Objective: This module aims to develop both programming logic and web development skills. Students will learn to design software using object-oriented principles and create dynamic, interactive web and multimedia applications. Submodules: CSE221 – Object-Oriented Programming: Introduction to classes, objects, inheritance, encapsulation, polymorphism, and exception handling using a high-level language (e.g., Java or C++). CSE222 – Web and Multimedia Programming: Design and implementation of interactive websites using HTML, CSS, JavaScript, and PHP. Integration of multimedia elements and dynamic content for enhanced user experience. 			



Module Code	Module Descriptions for Semester 2			
	Code: CSE230	Hourly volume: 117	Credit: 4.5	
Preparing to certification I	 Objective: This module helps students prepare for internationally recognized IT certifications. It covers core competencies in Linux system administration and networking fundamentals, ensuring readiness for professional exams and real-world technical challenges. Submodules: CSE231 - Preparing for LPI 101 Certification: Covers Linux essentials: shell commands, system architecture, file systems, GNU/Linux installations, users and permissions, and scripting basics. CSE232 - Preparing for CCNA1 Certification: Introduction to networking: OSI model, IP addressing, Ethernet, switching concepts, and basic router configuration using Cisco Packet Tracer. 			
	Code: CSE240	Hourly volume: 156	Credit: 6	
Architecture and Transmission	 Objective: This module introduces students to the fundamentals of digital communication systems and the internal architecture of computing systems. It aims to develop an understanding of how data is transmitted, processed, and interpreted by digital systems. Submodules: CSE241 - Digital Transmission: Focuses on digital signal transmission, sampling, modulation, encoding techniques, error detection/correction, and transmission media. CSE242 - Architecture & Microprocessors: Covers computer architecture fundamentals, processor structure, instruction sets, memory hierarchy, buses, and the basics of microcontroller and microprocessor operation. 			
	Code: LAC250 Hourly volume: 117 Credit: 4.5			
Languages and cultures II	 Objective: Improve students' communication skills in both English and French for academic and professional contexts, while offering basic financial and banking knowledge. Submodules: LAC251 – English II: English for Computer Science II: Focuses on technical English used in computer science, including writing reports, presentations, and mastering IT vocabulary in a professional context. LAC252 – French II: Communication Technique and Preparation for DELF B2: Prepares students for the DELF B2 exam through practical exercises in professional communication, including CVs, cover letters, and job interview simulations. LAC253 – Introduction to Financial Systems and Banking Management: Provides an overview of how financial systems and banks operate, covering essential topics like credit, interest rates, and financial institutions. 			



Module Code	Module Descriptions for Semester 2			
	Code: CSE260	Hourly volume: 39	Credit: 1.5	
Project II	by working on a re Submodule: CSE261 – Supervi work started in application—on t techniques they've data structures, or	sed Project II: In this cour Project I. They design heir own or in small t already learned (like object r system design). They a to their work, and present the	rse, students continue the and build a complete teams—using tools and et-oriented programming, also learn how to write	







Module Code	Module Descriptions for Semester3				
	Code: CSE310	Hourly volume: 195	Credit: 7.5		
Hard Design Methodology	 Objective: Introduce students to advanced digital design methodologies, focusing on hardware architecture and systems-level design. Submodules: CSE311 - Processor Design Methodology: Study of processor architecture and design stages, including datapath and control units. CSE312 - Operating Systems and Concurrent Programming: Concepts of operating systems, process/thread management, synchronization, and parallelism. 				
	Code: CSE320 Hourly volume: 234 Credit:9				
Algorithms, Databases and Operational Research	 Objective: Provide students with strong foundations in computational logic, decision science, and data organization, supporting problem-solving and system modeling. Submodules: CSE321 – Algorithm Design and Analysis: Techniques for designing efficient algorithms and analyzing their complexity. CSE322 – Operational Research: Mathematical modeling and optimization techniques for decision-making. CSE323 – Database Design: Concepts of relational databases, ER modeling, normalization, and SQL 				
	Code: CSE330 Hourly volume: 156 Credit: 6				
Software Engineering	 Objective: Deepen understanding of software lifecycle stages and object-oriented design to support scalable software solutions. Submodules: CSE331 – Software Engineering I: Study of software development phases, documentation, and quality control. CSE332 – Object-Oriented Analysis and Design: Application of UML and object-oriented design principles for system modeling. 				



Module Code	Module Descriptions for Semester3			
	Code: CSE340	Hourly volume: 117	Credit: 4.5	
Preparing to Certification II	 Objective: Prepare students for professional certifications by reinforcing practical skills in networking and system administration. Submodules: CSE341 - Preparing for the CCNA2 Certification: Advanced networking configuration and troubleshooting for Cisco environments. CSE342 - Preparing for LPI 102: Mastery of Linux system administration topics aligned with LPI objectives. 			
	Code: LAC350	Hourly volume: 78	Credit: 3	
Languages and Cultures III	 Objective: Strengthen communication and documentation skills in professional and international settings. Submodules: LAC351 – English III: English for Specific Purposes I: Professional English tailored to IT contexts (emails, reports, presentations). LAC352 – French III: Communication Technique and Preparation for DELF Pro 1: Oral and written expression in business contexts, aligned with DELF Pro standards. 			





Module Title	Module Descriptions for Semester				
	Code: CSE410	Hourly volume: 156	Credit: 6		
Soft Design Methodology	to manage real-wordeployment. Submodules: CSE411 – Design and methodologies for s	Ivanced software design priced development projects and Development Projects: tructuring, planning, and ototyping and iterative design	Focuses on practical executing software		
		e Engineering II: Builds lge, emphasizing design nance strategies.	-		
	Code: CSE420 Hourly volume: 156 Credit :6				
IoT and Embedded Systems	 Objective: Introduce students to embedded computing and Internet of Things (IoT) technologies, highlighting both hardware and networking considerations. Submodules: CSE421 – Embedded Systems: Covers microcontrollers, sensors, and real-time programming for small-scale, specialized devices. CSE422 – Networking Computer: Looks at low-level communication protocols, network configuration for IoT devices, and secure data transfer. 				
	Code: CSE430	Hourly volume: 117	Credit :4.5		
Decision Support and Database Management	 Objective: Equip students with the skills to design robust databases and leverage AI methods for data-driven decision-making. Submodules: CSE431 – Database Management Systems: In-depth study of relational and non-relational databases, optimization, and transaction management. 				
	CSE432 — Artificial Intelligence: Introduction to AI concepts like search algorithms, basic machine learning, and intelligent agents for problem-solving.				



Module Title	Module Descriptions for Semester				
	Code: LAC440 Hourly volume: 117 Credit :4.5				
Languages and Cultures III	 Objective: Strengthen communication and entrepreneurial skills, preparing students for global professional environments. Submodules: LAC441 – English IV: English for Specific Purposes II: Advanced English usage in tech, including complex presentations, technical document review, and professional correspondence. LAC442 – French IV: Communication Technique and Preparation for DELF Pro 2: Builds on DELF Pro 1 foundation, focusing on advanced written/oral communication and formal business interactions in French. LAC443 – Business Creation and Systems Management: Introduction to entrepreneurship, covering startup creation, basic finance, and management systems. 				
	Code: CSE450 Hourly volume: 156 Credit :6				
Architecture and Programming	 Objective: Deepen understanding of software architecture and functional programming paradigms to tackle complex software design. Submodules: CSE451/1 – Functional Programming: Covers pure functional languages, higher-order functions, and immutability to promote efficient, bug-resistant code. CSE452/1 – Software Architecture: Addresses architectural styles (microservices, layered, etc.), modeling techniques, and best practices for large-scale systems. 				
	Code: CSE460 Hourly volume: 78 Credit :3				
Project III	 Objective: Consolidate all previously acquired skills comprehensive end-of-year project that highlights planning, implementation, and deployment. Submodule: 				
	 CSE453/1 – End Year Project: Students work in teams to design, code, test, and present a complete software or embedded solution. Focus or real-world constraints, documentation, and polished deliverables. 				





Module Title	Module Descriptions for Semester 5						
	Code: LAC510	Code: LAC510 Hourly volume: 78 Credit: 3					
Languages and Corporate Culture	 Objective: Strengthen students' professional communication in English and broaden their cultural awareness. Introduce essential soft skills in project management and human rights understanding. Submodules: LAC511 – English V: Business Communication: Focuses on advanced business English for presentations, negotiations, and professional documentation. LAC512 – Human Rights: Introduces key concepts of human rights, ethical considerations, and their relevance in the corporate world. LAC513 – Project Management: Covers the fundamentals of managing projects: planning, resource allocation, risk management, and leadership. 						
	Code: CSE520	Hourly volume: 182	Credit :7				
Massive Data Management and Virtualization	 Objective: Objective: Equip students with methods to handle large-scale data and familiarize them with cloud computing and virtualization technologies. Submodules: CSE521/1 – Data Mining and Analysis: Techniques for discovering patterns, classification, clustering, and predictive modeling in large datasets. CSE522/1 – Virtualization and Cloud Computing: Fundamentals of virtualization layers, virtual machines, containers, and deployment on cloud platforms. CSE523/1 – Big Data Framework & Technologies: Introduction to popular Big Data ecosystems (Hadoop, Spark) and best practices for scaling data processing. 						
	Code: CSE530	Hourly volume: 78	Credit :3				
Systems Security	 Objective: Provide an in-depth look at securing IT infrastructures, focusing on risk management, defense strategies, and ensuring system reliability. Submodules: CSE531/1 – IT Security: Covers network security, cryptography 						
Security	 basics, intrusion detection, and best practices for safeguarding information. CSE532/1 – Operational Safety and Fault Tolerance: Deals with system reliability, backup strategies, redundancy, and disaster recovery to maintain continuous operations. 						



Module Title	Module Descriptions for Semester 5			
	Code: LAC540	Hourly volume: 130	Credit :5	
Interactive decision support systems	 Objective: Explore advanced techniques for interactive data analysis and decision-making, bridging AI methods with user-centric tools. Submodules: CSE541/1 – Interactive Decision Support Systems: Design of DSS architectures, dashboards, and real-time analytic solutions for enterprise decision-making. CSE542/1 – Advanced Machine Learning: Delves into complex ML techniques (deep learning, reinforcement learning) to build intelligent decision-support applications. 			
	Code: CSE550	Hourly volume: 78	Credit :3	
Software Quality and Architecture	 Objective: Emphasize software quality assurance, validation processes, and hands-on experience in advanced project architecture. Submodules: CSE551/1 – Preparation for ISTQB Certification: Covers fundamental software testing methodologies, test design, and validation aligned with ISTQB standards. CSE553/1 – Software Architecture Project: Involves implementing robust architectural patterns in a real-world project, focusing on maintainability, scalability, and documentation. 			
	Code: CSE560 Hourly volume: 156 Credit :6			
Software Development	 Objective: Deepen students' understanding of modern software engineering approaches, from service-oriented to model-driven techniques, culminating in advanced web solutions. Submodules: CSE561/1 - Service-Oriented Engineering: Focuses on SOA principles, microservices, and RESTful APIs for scalable, decoupled systems. CSE562/1 - Model-Driven Engineering: Explores modeling languages (UML, DSLs), transformations, and automated code generation. CSE563/1 - Development of Advanced Web Applications (JEE/.NET): Practical skills in building robust, enterprise-grade web apps using frameworks like Spring, EJB, ASP.NET, etc. 			



Module Title	Module Descriptions for Semester 5			
	Code: CSE570	Hourly volume: 78	Credit :3	
Mobile Programming	on platform-specifications on platform-specifications on platform-specifications of the submodules: • CSE571/1 – Mob (Android/iOS), Uperformance. • CSE572/1 – Dissiparding, and synchronments. • CSE573/1 – Projestudents design, in	students in mobile software fic constraints and distribute lile Programming: Introducting Introduction design, device APIs, a stributed Database: Covers are mechanisms tailored to let in Mobile Programming: mplement, and deploy a content database and networking	d data considerations. Ion to mobile platforms and best practices for a database replication, mobile and distributed Capstone project where mplete mobile solution,	







Module Title	Module Descriptions for Semester 6		
Professional Traineeship	Code: CSE660	Hourly volume: 780	Credit: 30
	Objective: Offer students hands-on industry experience and an opportunity to apply theoretical knowledge to real-world projects, culminating in a substantial graduation research project. Submodules: CSE660/1 – Internship 1 (1–2 months): Short-term placement aimed at introducing students to professional environments. Focus on discovering company culture, team collaboration, and applying foundational skills acquired from coursework. CSE660/2 – Internship 2 (1–2 months): Intermediate placement that deepens students' technical and soft skills. Emphasis on more significant responsibilities, problem-solving, and contributing to ongoing projects within the host organization. CSE660/3 – Graduation Research Project (4–6 months): A capstone endeavor requiring extensive research, design, and implementation. Students produce a dissertation and defend their work, showcasing mastery of their chosen specialty and readiness for the professional world.		