



PROGRAM PEDAGOGICAL COORDINATOR
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PROGRAM'S GOALS

The Artificial Intelligence Engineering (AIE) program's major goal is to offer student engineers with solid abilities in learning the most commonly used methodologies, methods, tools, and languages in the field of Artificial Intelligence (AI) while relying on fundamental math and computer science expertise. These abilities will enable the student engineer to design algorithms, propose models, and develop systems and applications that incorporate the most recent breakthroughs in AI.

To completely achieve this goal, the AIE program uses the Project Approach in all courses to familiarize students with projects that are analogous to commercial tasks in which AI techniques and approaches will be necessary. Automation of reactive systems, Multimedia Mining, Social network analysis, Forecasting systems, Recommendation systems, natural language comprehension, man-machine cooperation, Games, and so on are some of the application challenges addressed in these projects. An important place is also given to management and language and communication courses.

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
- Candidates who have passed the national common admissions exam for engineering training institutions and affiliated institutions
- DEUG (Bachelor's degree first cycle) : Mathematical Sciences (SM) or Computer and Mathematical Sciences (SMI), Competition-based Access
- Bachelor's degree in Applied Mathematical Sciences (SMA) or SMI, Degree-based Access
- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

The professions targeted by the 2IA profile span numerous industries (Banks, Service firms, Multinationals, R&D Laboratories, etc.) that are increasingly demanding AI technologies and their ability to raise productivity, reduce costs, and improve user experience.

ENSIAS AIE engineers can work in the following fields:

- AI Engineer
- R&D Engineer
- Language Programming Engineer
- Data Analyst
- AI Integrator
- AI Architect

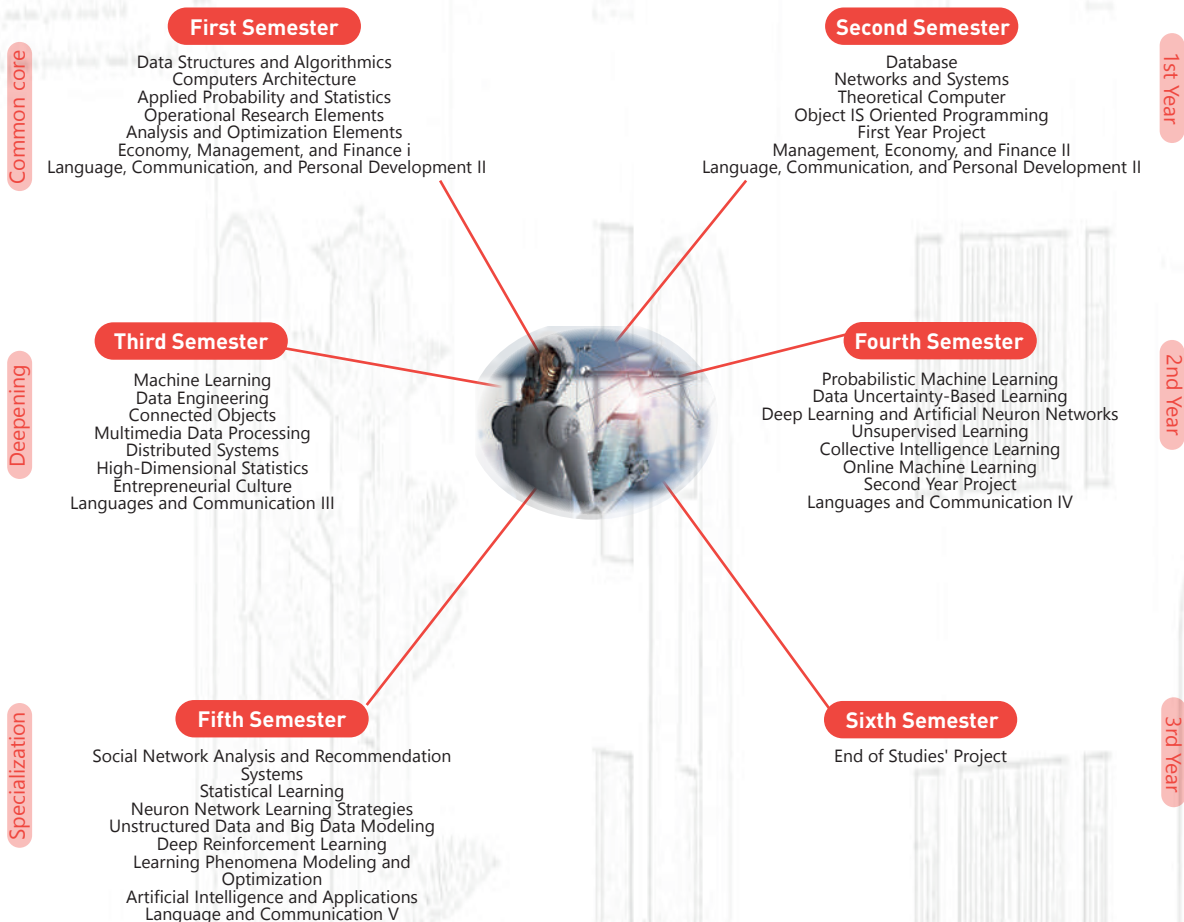


SIGNIFICANT LEARNING ABILITIES

Students will be able to do the following at the completion of this training:

- Learn the core theory of machine learning, deep learning, reinforcement learning, bio-inspired models, and multi-agent systems.
- Understand the fundamentals of mathematical programming and development languages.
- Transform a real-world problem into an automated or bio-inspired modeling challenge, then select the suitable model and optimization technique for each model.

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR PROF. ABDELLAH EL MANOUAR

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PROGRAM'S GOALS

The BIA program is a revamped version of the previously approved eMBI and is well-known in the market for its exceptional training and graduates' ability.

Previously, the Analytics dimension was part of the BI program. Given the enormity of the Analytics dimension's growth over the last five years with the Data age (coming of Big Data, Cloud Computing, etc.), the two fields of BI and Business Analytics are now emerging as two distinct but interrelated domains.

In this perspective, the BIA program provides training based on current developments in these two domains, BI and Business/Data Analytics, in terms of IT systems and solutions for effective organizational administration.

All ENSIAS programs share the first year of training, during which students receive basic knowledge and solid skills required to any computer engineer in computer science, communication networks, applied mathematics, management, as well as languages and communication techniques. Mainly, the BIA program intends to teach computer engineers who are conversant with the many crafts of contemporary business (management control, finance, project management, customer relations, e-commerce, and so on) as well as specialists in:

- Business intelligence
- Business/Data Analytics
- Information, and knowledge Management
- Integration of e-business solutions
- Business performance Management

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
- Candidates who have passed the national common admissions exam for engineering training institutions and affiliated institutions
- DEUG (Bachelor's degree first cycle) : Mathematical Sciences (SM) or Computer and Mathematical Sciences (SMI), Competition-based Access
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- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

Engineers with a BIA profile, who understand business intelligence, data sciences, e-business solutions, and project management, are in high demand across all industries (private companies, administrations, auditing and consulting, etc.).

ENSIAS BIA engineers are qualified to work in the following fields:

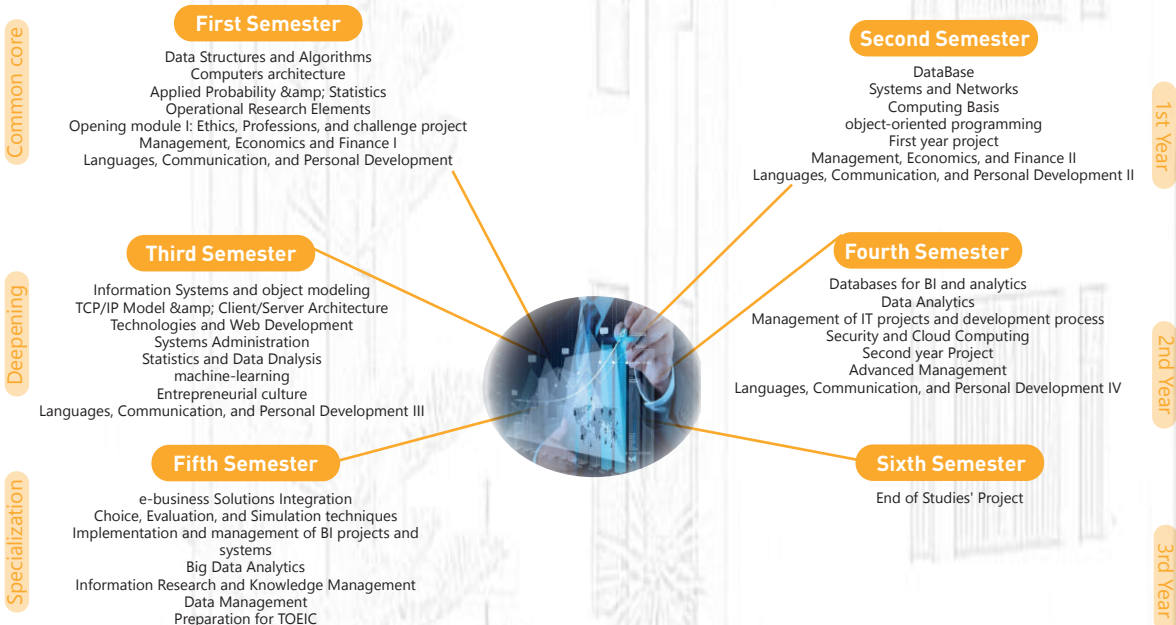
- Business Intelligence Engineer
- Analytics Engineer
- Data Analyst
- Data Scientist
- Decision-Making System Auditor

SIGNIFICANT LEARNING ABILITIES

The BIA engineering student will have gained the following specialist abilities in addition to the basic skills targeted by the core modules common to all programs:

- Have a solid understanding of DBMS
- Have a strong understanding of information systems
- Have a strong knowledge of databases (Multidimensional DB, NoSQL)
- Understand Big Data technologies;
- Master the ways of creating and conducting decision-making projects
- Discover and control the market's most up-to-date and efficient decision-making tools (data extraction, analysis, and restoration).
- Be well-versed in data analysis and Machine Learning methodologies and technologies.
- Learn and use the datamining project strategy and algorithms.
- Mastering the Big Data analytics project implementation process
- Becoming acquainted with data management concepts
- Having a good understanding of techniques and tools for researching information and knowledge management in the context of monitoring
- Understanding how to model the company's business processes
- Learning to integrate e-Management solutions in their current variety and complexity (ERP, CRM, e-commerce, HRM, PMO, e-finance, etc.)
- Mastering decision support methodologies and tools to analyze and suggest the best options for the firm
- Assist in the company's management control and performance management
- Manage business projects by regulating costs, timelines, and quality
- Become acquainted with project management tasks using the PMO technique.

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR

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PROGRAM'S GOALS

Data engineering is a multidisciplinary area that employs Databases, Distributed databases, Unstructured databases, Statistics, Machine/Deep learning, Data-driven architecture, Data quality, Data analysis, Big Data, Development Methodology, Project Management, Cloud.

The DE program aspires to innovate at three levels: the engineering profession, education, and the trained engineer profile. Indeed, the DE program is organized around three primary goals:

1. Train data engineers capable of conceptualizing architectures ranging from data interference to data quality preparation at the service of Data Scientists (DS), as well as being able to intervene with DS and understand their business and needs in order to optimize their code. It is a highly sought-after corporate profile that is at the forefront of technical innovation.
2. Train R&D engineers and innovators capable of carrying out R&D projects in the field of data, inventing, and turning ideas into a source of financial income and employment.
3. Train the engineer as a pedagogical paradigm around the innovation project, allowing him/her to learn the profession and skills required to succeed in his/her innovation project or, if necessary, to easily integrate into a firm.

ACCESS CONDITIONS

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TRAINING'S OPPORTUNITIES AND BENEFITS

Data occupations are becoming increasingly popular in both the corporate and governmental sectors. ENSIAS ED engineers are prepared to occupy the following professions:

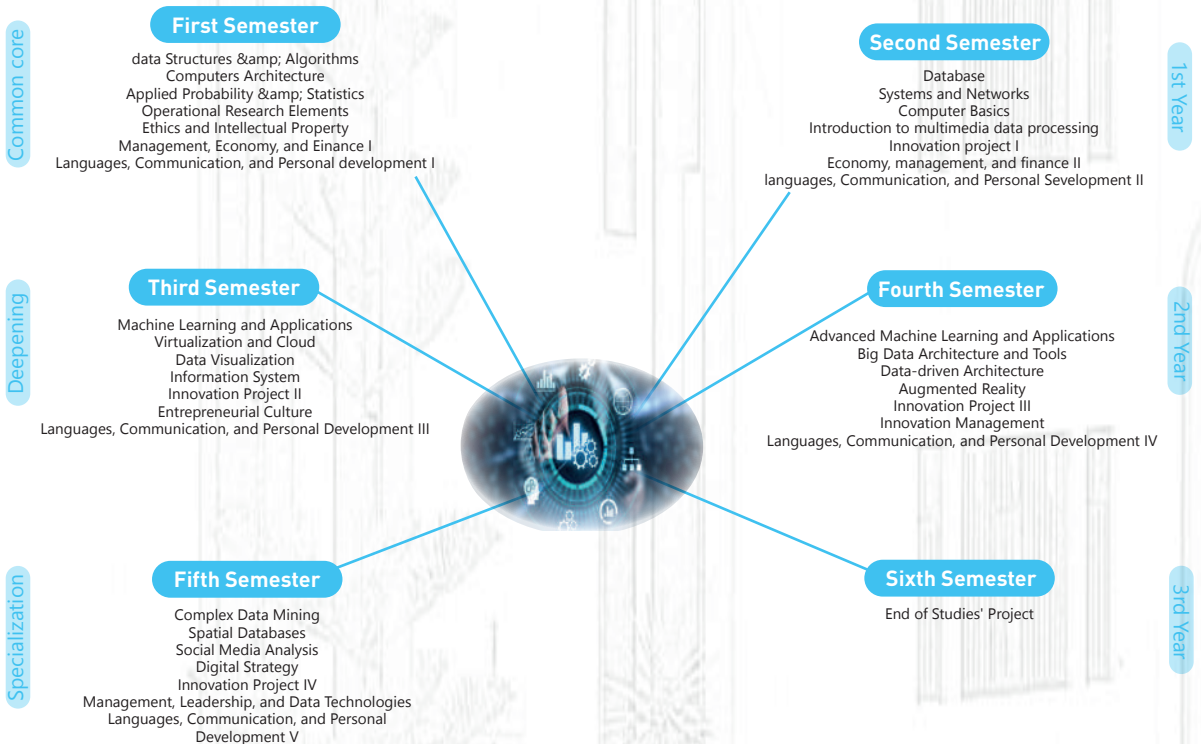
- Big Data Developer
- Data Engineer
- DevOps/DataOps Engineer
- Big Data Architect
- Media Convergence and Information Technologies Expert
- Geographic Information System (GIS) Manager

SIGNIFICANT LEARNING ABILITIES

The DE program strives to innovate at both the engineering profession and the trained engineer profile. The following are important abilities to learn:

- Understand the company's digital environment, gather, prepare, and store its data, allowing DS to improve it and construct models.
- Being able to intervene both upstream and downstream of the company's Data projects, assisting DS in the industrialization of their models, optimizing their code, ensuring the usability of their solution, scaling them up, and assisting with automated testing, deployment, and order processing.
- Understand and master the process of a Data project, beginning with the extraction of multi-source data and various structures (image, video, audio, text) in rich contexts of relational, multidimensional, temporal databases, multimedia, geographic, and NoSql, and ending with data analysis and enhancement. Because of this culture, he/she is able to act both upstream and downstream of a Data project to ensure its success.
- Lead R&D initiatives in the field of data, develop, and turn ideas into a source of financial income and employment.
- Understand product, process, and service quality assurance methodologies for software applications across their life cycle, from original needs definition through maintenance.
- Learn project planning, control, and management approaches for software development and, more broadly, information systems projects.

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR
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PROGRAM'S GOALS

The Digital Engineering for Finance (DEF) program aims to train professionals capable of meeting the needs of banking firms looking for executives who can master applied mathematics, finance, and computer science all at the same time, and this for research and development functions for new finance and risk management tools and services.

The Digital Engineering for Finance program seeks to:

- Provide exceptional training in financial and digital skills; Promote worldwide mobility through an international career path developed in collaboration with international partners;
- Mastering Fintech Entrepreneurship
- Be open to diverse professional viewpoints in all fields of finance
- Be proficient in numerical and statistical tools, including machine learning approaches
- Learn sophisticated quantitative finance strategies.
- Mastery of financial analysis skills according to the CFA Institute Curriculum
- Have the perspective required to adapt to developments in the field of study or industry.

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
- Candidates who have passed the national common admissions exam for engineering training institutions and affiliated institutions
- DEUG (Bachelor's degree first cycle) : Mathematical Sciences (SM) or Computer and Mathematical Sciences (SMI), Competition-based Access
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- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

Digital engineers in finance will be able to work in the following roles:

- Financial Analyst
- Financial Data Scientist
- Risk Manager
- Trade Actuary
- Finance Director...

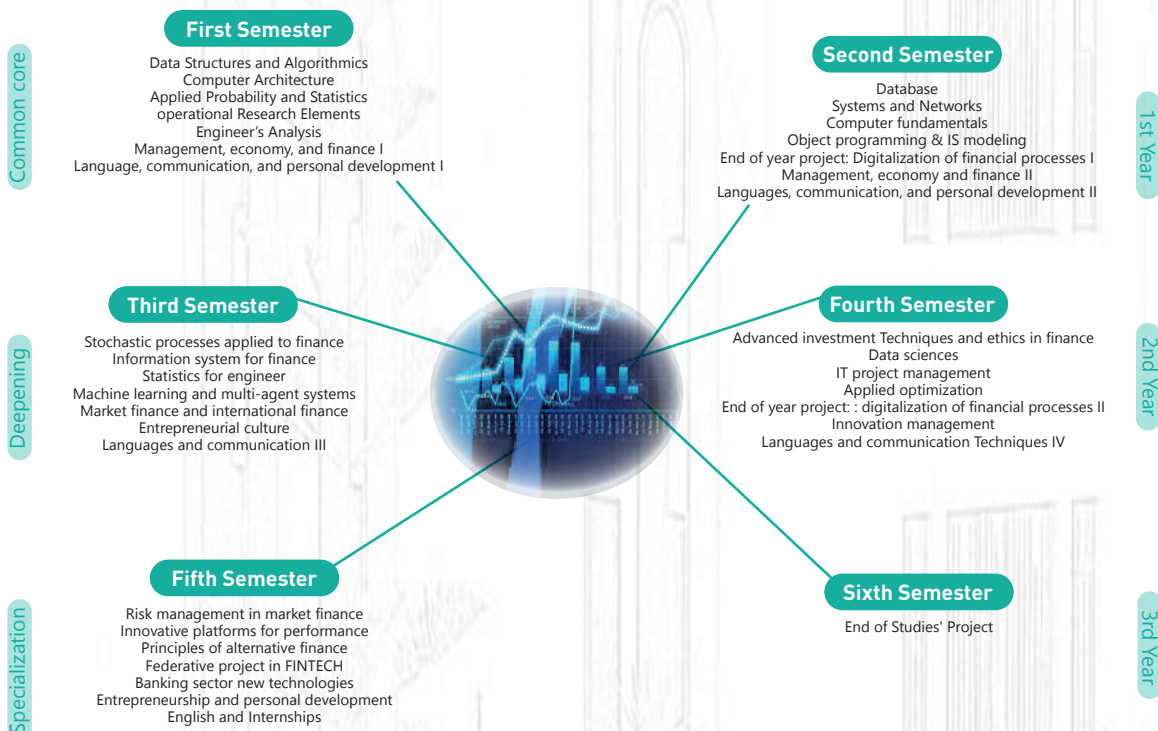


SIGNIFICANT LEARNING ABILITIES

The DEF program focuses on the following skills

- Modeling and formalizing financial problems
- Mastery of financial analysis methods according to the CFA Institute Curriculum;
- Development of algorithms for financial problem resolution
- Design, development, and implementation of algorithms based on Artificial Intelligence and Machine Learning for finance
- Financial risk modeling
- Design of novel financial applications and solutions
- Design and administration of information systems for banks and financial institutions
- Implementation of numerical techniques for price computation and derivative hedging
- Understanding, specifying, and taking into account user requirements

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR
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PROGRAM'S GOALS

The goal of this program is to provide highly competent engineering students with a comprehensive basis in computer science and a speciality in developing topics such as Data Science, Web engineering, DevOps, Software Quality, and Big Data. By the end of this training, engineering students will be able to respond to problems related to the implementation of projects in Web and Mobile Engineering, as well as the exploitation of data within companies, using various machine learning algorithms or the proper application of Big Data technologies.

This program also equips students with cutting-edge technology for developing apps for organizations on a variety of Web, Mobile, and Cloud platforms. They will be able to create apps that fulfill the current quality requirements while adhering to the key concepts of software quality.

Options :

- Web Analytics Engineering
- IoT and Mobile Services Engineering.



ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
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TRAINING'S OPPORTUNITIES AND BENEFITS

With the emergence of Web 4.0, the Mobile and Web professions have expanded in recent years, which explains the high need for these profiles in the labor market.

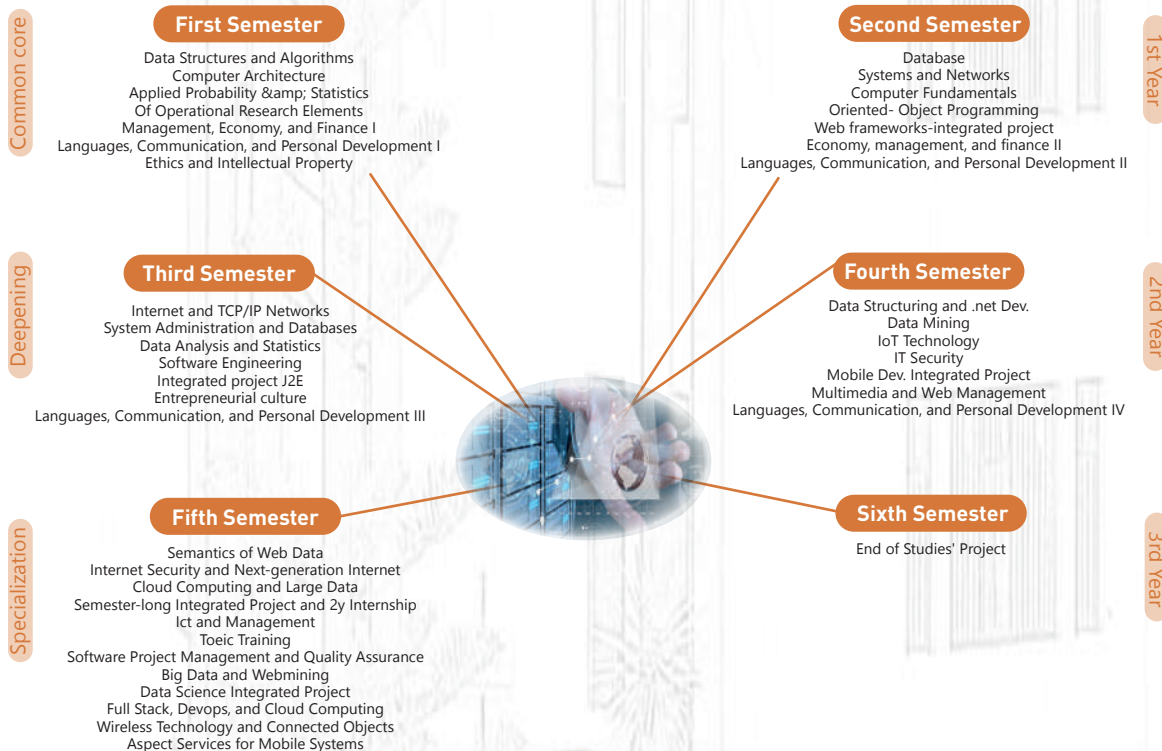
ENSIAS DSIoT engineers are prepared to work in the following fields:

- Web/Mobile Development Engineer
- Web Data Analysis Engineer
- Services and Mobile Networks Engineer
- Web Solution Architect
- Consultant in IoT and Mobile Technologies

SIGNIFICANT LEARNING ABILITIES

- Understand fundamental computer science (Programming, Information Systems, Databases, Teleinformatics, etc.)
- Expertise in Empirical Software Engineering
- Understand how to create web solutions
- Understand how to use Machine Learning algorithms in business.
- Be able to do webmining and datamining
- Be able to apply sophisticated big data techniques based on IoT databases.
- Understand how to lead a DevOps project.
- Be able to develop high-quality Web and mobile applications.
- Understand how to put network and cloud applications into action.
- Have the ability to manage agile software projects.
- The ability to design, develop, and deploy mobile and distributed applications as well as infrastructure.
- Be able to design prototypes as well as construct mobile applications.
- Mastering object-to-object communication
- Understand the key development environments such as Android, J2E, IOS, and others.
- Understanding security in Internet of Things (IoT) systems

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR
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PROGRAM'S GOALS

The "Smart Systems Engineering" program provides instruction based on cutting-edge pedagogy to help students gain new skills. This program equips graduates with agile and adaptable abilities in new technologies such as IoT, Industry 4.0, AI, robots, and so on. Besides, two options are offered by the program: the first is focused on Industry 4.0 and IoT, while the second is co-developed with industrial partners and focuses on autonomous systems, particularly automobiles (alternating with STELLANIS), avionics (BOEING), and medical devices (IRC-FLS). Graduates will be able to process, evaluate, and generate smart solutions in a variety of industries, including industry, smart cities, smart buildings, smart agriculture, etc.

This training incorporates innovation at several levels:

- **Training design:** The SSE program is developed from the top down to match the emerging job market needs. It is primarily based on a competency-based approach that employs worldwide benchmarks.
- **Pedagogical approaches:** The SSE program's program employs active methods in its pedagogical operation. Skills development for first and second year students is mostly centered on flipped courses and hybrid teaching. In contrast, in the previous year, the abilities to be imparted to pupils were gained through the «project-based learning» approach. As a result, the DEFIS space supports the program (ENSIAS FabLab).
- **Teaching methods:** The SSE stream program can be delivered in-person, remotely, or hybridly, using MOOCs, video clips, and reference books.
- **Languages of instruction:** The first and second years of the SSE program are taught in French or English, while the third year is taught in English. In the second year, students are given an introduction to the Asian language.
- **Certifications:** The SSE program provides students with a variety of certifications from our partners, including CISCO, IBM, NI, and others.
- **International mobility:** The medium-term vision is to switch completely to English in order to be able to travel from and to the south (English or French-speaking) and from and to Asian, American and European countries.

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
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- Bachelor's degree in Applied Mathematical Sciences (SMA) or SMI, Degree-based Access
- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

The SSE program focuses on new professions that demand agility, flexibility, and a strong capacity to tackle the increasingly complex issues that business faces. ENSIAS 4.0 SSE engineers can thus work in the following fields:

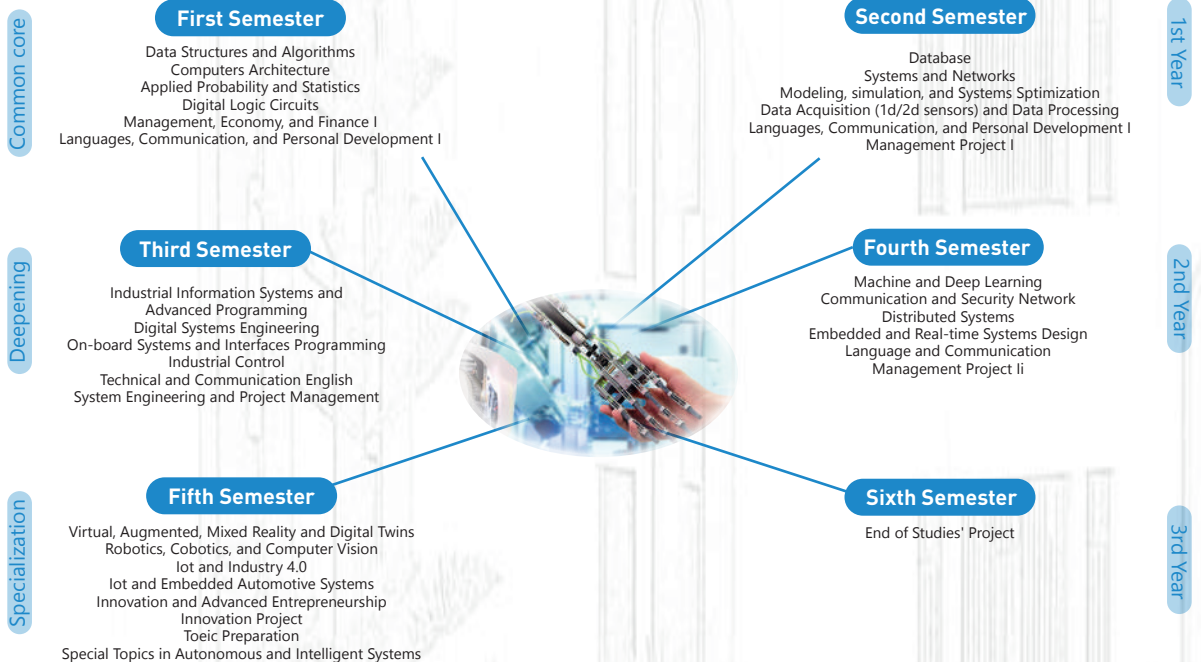
- Engineers in robotics/cobotics
- Industrial computer engineer
- Digital simulation/XR (Extended Reality)/DT (Digital Twin) engineer
- IoT developer engineer
- Industry 4.0 architect
- Industrial Big Data expert (industrial Data Scientist)

SIGNIFICANT LEARNING ABILITIES

After completing this program, students should be able to:

- Be aware of and comprehend the increased needs for competitiveness that an industrial firm faces in a worldwide economic climate, with a special emphasis on the technological innovation process management.
- Understand and use new Industry 4.0 standards and architectures to deal with the confluence of the worlds of operations and information technology.
- Understand and implement breakthroughs in the field of industrial robotics, particularly collaborative robotics and its use in manufacturing processes.
- Recall the terminology and key elements of the digital transformation to intelligent systems and Industry 4.0.
- Gain an understanding of the fundamental technological components of intelligent systems and Industry 4.0.
- Use methodologies and tools to harvest data for intelligent systems and Industry 4.0.
- Examine the economic, societal, organizational, and technological implications of intelligent systems and Industry 4.0.
- Assess the usefulness of intelligent systems and Industry 4.0 scenarios and elements to a business.
- Develop original solutions for many facets of intelligent systems and industry 4.0.

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR

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PROGRAM'S GOALS

The ISS program aims to train computer engineers who specialize in Information Systems Security and realize the importance of digital trust in the national growth of the digital economy. It accomplishes this by providing students with a solid technical foundation based on active educational approaches, allowing them to:

- Have a strong knowledge of computer science, especially in the areas of communication networks, operating systems, databases, and web technologies.
- Learn about the different difficulties surrounding the governance of information system security at both the organizational and management levels, as well as the legal level.;
- Recognize the security concerns associated with the usage of virtualization and Cloud Computing, and also Web and mobile technologies;
- Have a thorough understanding of cryptography, which is required to comprehend the technologies and solutions used to safeguard information systems and e-services.
- Acquire knowledge that covers a substantial portion of the Certified Information Systems Security Professional (CISSP) certification's Common Body of Knowledge (CBK) through numerous training courses;
- Learn how to use the key technologies (including Blockchain technology), solutions, and methodologies in the field of information security (physical, system, network, and application security);
- Possibility of obtaining the CEH (Certified Ethical Hacking) certification, one of the most sought-after in the security field. Finally, as a result of the proliferation of e/m-services and the emergence of technologies connected to blockchain and artificial intelligence, this program intends to train students to examine security challenges that stretch far beyond, and increasingly beyond, the limits of a corporation.

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
- Candidates who have passed the national common admissions exam for engineering training institutions and affiliated institutions
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TRAINING'S OPPORTUNITIES AND BENEFITS

The dangers associated with cybersecurity are regarded as among the most significant in any firm genuinely engaged in digital transformation, especially given the global dearth of expert profiles in IS security. ENSIAS SSI engineers are taught to contribute to the establishment of an atmosphere of digital trust by working in the following fields:

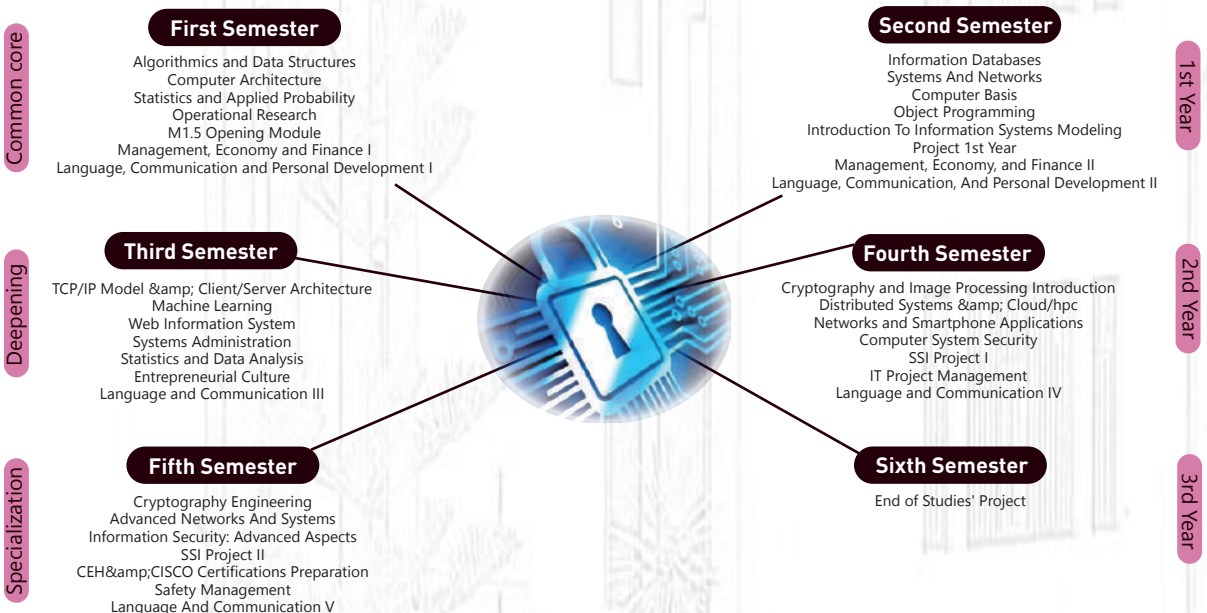
- Security Engineer
- System Administrator/Network Administrator
- Security Operation Center Analyst
- Security Architect
- IT Risk Manager
- Auditor in Information Security
- Head of Information Systems Security

SIGNIFICANT LEARNING ABILITIES

In addition to basic information technology skills, the main skills sought by this industry are:

- Developing security policies that strike a balance between occupational needs and those related to confidentiality, integrity, and availability.
- Execute threat assessments (including attack scenarios) and penetration tests, evaluate/hierarchize vulnerabilities using appropriate tools (while adhering to applicable laws and regulations) in order to: assess security risks for the company's information assets (by drawing on industry standards and risk-analysis methods), identify gaps in relation to security policy, and make recommendations.
- Supervise the security program of an information system by relying on references and standards (such as those in the ISO 27000 family) and keeping an eye on: the implementation of security policies, the planning of continuity of activity and resumption after an incident, employee safety, and compliance with regulatory and legal requirements (including those pertaining to the protection of personal data).
- Using appropriate defensive measures (including specific controls for operating systems, networks, and applications, etc.) and information carefully selected and gathered from various sources to identify, analyze (using Machine Learning algorithms), and signal events that occur or may occur within an information system (particularly via networks) in order to preserve it from threats and vulnerabilities.
- Conveniently administer and configure an operating system (Unix or Windows), a network (including switches, multiplexers, routers, firewalls, etc.), or data bases while keeping security in mind (access control, strong authentication, account management with privilege separation, and so on).
- Evaluating the solutions and approaches required for the secure design/development of a web or mobile application or the security of electronic transactions (e-commerce, e-government, e-health, etc.) by relying on security protocols and cryptographic technology.
- Providing security advice to decision-makers and top executives while ensuring compliance with current laws and regulations.

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR

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PROGRAM'S GOALS

The main goal of the Software Engineering (SE) program is to train computer engineers with a dominant focus in SE and Information Systems, specialists in the discipline, on the cutting edge of technology, autonomous, communicative, and capable of meeting the needs of public bodies and the private sector while increasing their competitiveness. Essentially, the SE program provides the engineer with a comprehensive and thorough scientific and technical education. Management, language, and communication strategies are also covered in the program, as required by the national educational standards book.

The common core of two semesters is devoted to the development of fundamental knowledge and abilities required of every computer scientist, notably in the domains of Software Engineering and Information Systems.

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
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- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

SE training includes a wide range of IT professions that are in perfect unison with market need and that the ENSIAS SE engineer may occupy or progress towards, such as:

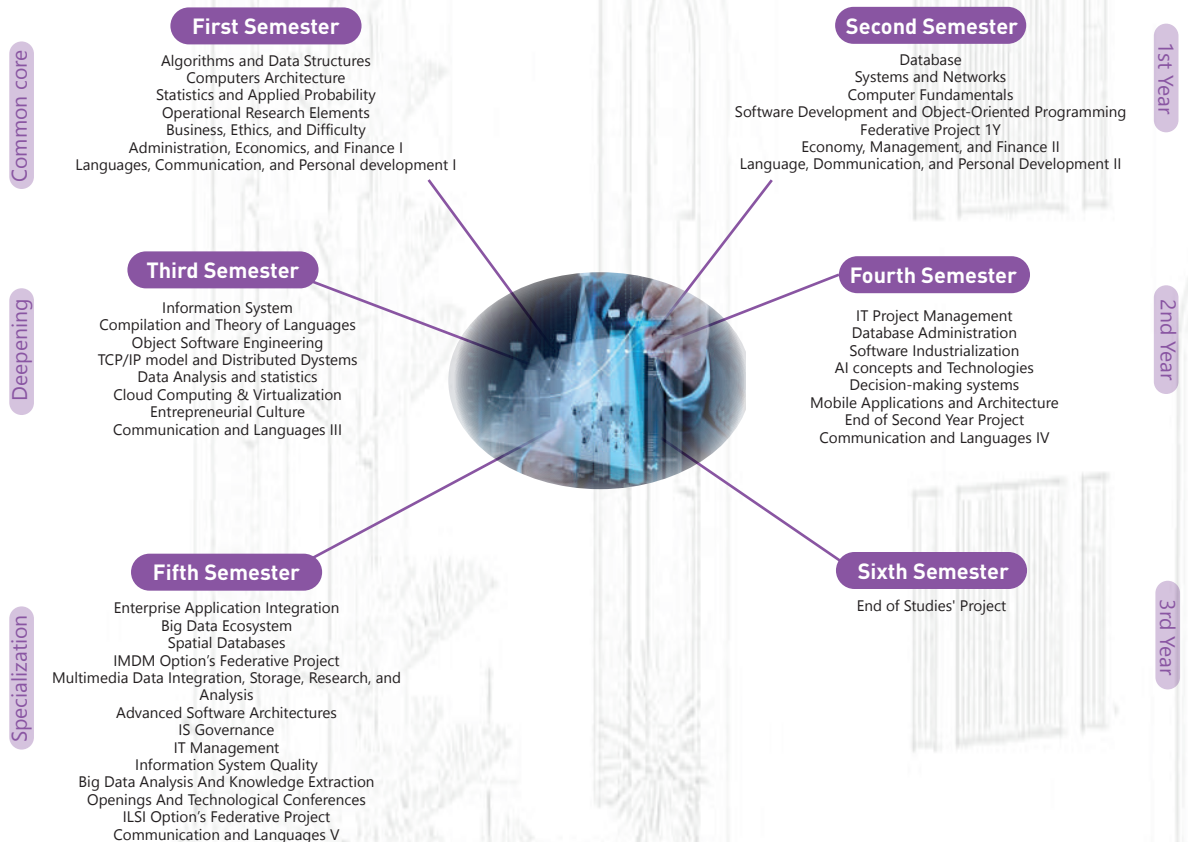
- Multimedia development engineer
- Enterprise Application Integrator
- IS Urbanist / Enterprise Architect
- Cloud Solution Architect
- Database/BigData Administrator
- Head of IS Operational Management



SIGNIFICANT LEARNING ABILITIES

- Teach professionals how to create and/or integrate software programs and well-structured, secure information systems based on standardized and flexible components.
- Be able to analyze, create, and build many forms of architecture in the disciplines of Software and Information Systems: Enterprise Architecture, Software, Data, and Technological Infrastructure.
- Ability to link information systems with the organization's «business» strategy as part of a global and sustainable service quality improvement policy
- Acquire product, process, and service quality assurance techniques for software applications throughout their life cycle, from initial needs specification to maintenance phase.
- Acquire product, process, and service quality assurance techniques for software applications throughout their life cycle, from initial needs specification to maintenance phase.
- Learn how to manage semi-structured data and acquire strong understanding for architectural implementation and huge data analysis.

MODULES PER SEMESTER





PROGRAM PEDAGOGICAL COORDINATOR

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PROGRAM'S GOALS

The 2SCL program is unique in that it ensures the integration of supply chain management tools and techniques with IT and artificial intelligence underpinnings. In fact, the training enables student engineers to learn the ideas and strategies that enable firms to compete in the global economy, as well as managerial tools and analytical approaches.

To serve its consumers and compete, the contemporary business must progressively optimize the performance of its purchasing procedures, inventory management, production planning, and so on. To satisfy these demands, the 2SCL program's training focuses on three primary areas:

1. learning basic problem-solving and data-analysis tools to assist the supply chain manager in making sound decisions;
2. Studying the main concepts and strategies for managing the people, materials, and production resources required to provide value to the customer;
3. Integrating the supply chain function into the company's overall strategy..

In addition to a common core with the other ENSIAS programs in the first year dedicated to the acquisition of fundamental IT skills, the two years of specialization in the 2SCL program offer advanced training in supply chains for the era of artificial intelligence. To that purpose, the student will become acquainted with theories on strategies, processes, information systems, logistics system modeling, model simulation, operation optimization, linked objects, artificial intelligence applied to the supply chain, and so on. The goal is to educate them with sound scientific and technological abilities to design and implement new supply chain management systems that are adaptable to the difficulties of organizational digital transformation.

ACCESS CONDITIONS

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- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

ENSIAS 2SCL engineers will be eligible for the following roles in any private or public firm that requires engineers that are both logisticians and computer scientists with a true capacity to handle decision-making problems:

- Assist logistics professionals
- Reliability analysts,
- Operational logisticians
- Truck driving jobs
- Fleet manager
- Planning supervisor
- Warehousing and handling jobs
- Inventory manager
- In charge of warehouses, stores, and platforms

SIGNIFICANT LEARNING ABILITIES

Following a two-semester common core with the other ENSIAS programs dedicated to the acquisition of knowledge and solid skills essential to any computer scientist, the 2SCL's student will be required to acquire the skills and essential tools allowing him to master the management of a supply chain in order to increase profitability and customer service. As a result, he will be able to work in organizations that specialize on the design and general administration of logistics systems. Therefore, in addition to obtaining fundamental understanding of computer science and decision support, a 2SCL program graduate must be able to:

- Understand decision-making issues;
- Recognize the various components of the global supply chain (supply, manufacturing and production, distribution, ERP, etc.) and the problems associated with their management;
- Recognize the skills required to manage supply chain risk, innovation, and dynamics in today's global economy.
- Develop computer and information technology abilities
- Develop strong analytical skills and a logical approach to problem resolution
- Identify and evaluate the functional and non-functional requirements of digital organizations (industries and companies)
- Improve both oral and written communication abilities to enable for productive interactions between different functional areas.

MODULES PER SEMESTER

