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degree program handbook

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General engineering school

Mechanical Design and Industrialization, Construction and Public Works, Mechatronics, Supply Chain Management and International Transport, Industrial Performance, Energy and Environment, Green Computing, Artificial Intelligence and Big Data, Industry 4.0, Network Architecture and Information Systems

GROUPE isae
PARTNER

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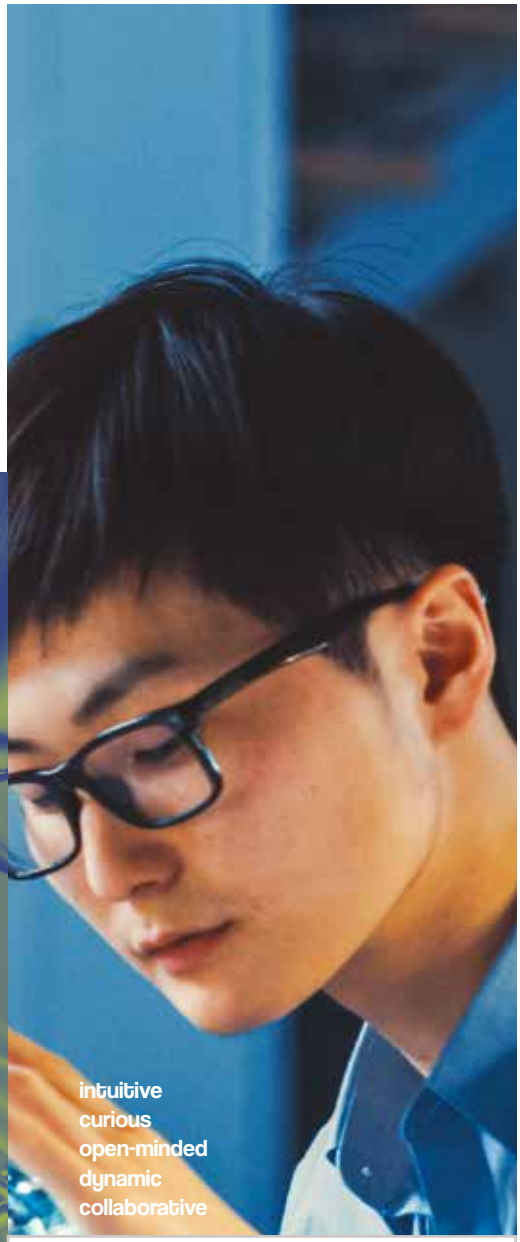
Commission des Titres d'Ingénieur

EIGSI
ÉCOLE D'INGÉNIEURS
LA ROCHELLE • CASABLANCA



be EIGSI

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EIGSI's engineering education is organized around a general core curriculum, after which the students specialize in a major during the last two years of study.

By majoring in a specific field, the students pursue their career goals and are operational upon graduation.

The majors are organized into 4 main sectors: Business Management and Organization, Digital Engineering, Mechanics, Aeronautics and Systems, Sustainable Energy Systems, Construction and Transportation.

EIGSI has developed a number of double degree programs for each of the majors, in France and abroad. Each student builds a unique educational experience that is enriched throughout the program by their choices of internships, projects, etc.

EIGSI
ÉCOLE D'INGÉNIEURS
LA ROCHELLE • CASABLANCA

4 SECTORS 11 majors

Mechanics, Aeronautics and Systems

The majors in the "Mechanics, Aeronautics & Systems" sector train engineers to effectively use the tools and methods involved in designing and/or improving industrial processes.

These engineers will work on scientific engineering projects and help design innovative machines that will provide solutions to the mobility challenges of a changing world.

With their operational excellence and their ability to design entire technical systems, these EIGSI graduates will hold management positions on major industrial projects.

Digital Engineering

In the digital age, engineers need to know how to extract knowledge from data.

The majors offered in the "Digital Engineering" sector will enable EIGSI engineers to become the engineers of the transition. They will be able to leverage digital tools and the high-growth applications that generate added value for CSR and cutting-edge technological innovations that make use of Big Data and artificial intelligence.

Sustainable Energy Systems, Construction and Transportation

Understanding the critical importance of changing our energy sources, while building green supply chains in construction and transportation, is the objective of the majors in the "Sustainable Energy Systems, Construction and Transportation" sector.

EIGSI engineers are experts in change and will have all the multidisciplinary skills and knowledge (circular economy, recycling, ecosystems, carbon-free green energy, etc.) needed to be able to propose new, technically viable solutions, whether in terms of positive-energy buildings or sustainable mobility.

Business Management and Organization

The majors in the "Business Management and Organization" sector will provide EIGSI engineers with all the skills needed to have an excellent global understanding of systems and be able to manage all types of flows, whether human, information or financial.

Their understanding of the global supply chain, their knowledge of industrial transition issues and their cross-disciplinary expertise will prepare them to work in today's changing organizations.

The coordinators OF THE MAJORS

Nicolas Olivier
Mechanical Design & Industrialization Major

Lecturer in Mechanical Engineering

Denis Philippe
Mechatronics Major

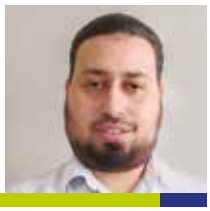
Lecturer-Researcher in Automatic Engineering

Eric Yatrides
Industrial performance Major

Lecturer in Industrial Management

Benjamin Duthil
Green Computing & Network Architecture & IS Majors

Lecturer-Researcher in Information Systems



Hamza Toulni
Artificial Intelligence and Big Data Major

Lecturer-Researcher in Computer Science

Esma Talhi
Healthcare Systems Engineering Major

Lecturer-Researcher in Information Systems

Yassine El Atmani
Construction and Public Works Major

Lecturer in Mechanics

Luminita Ion
Energy & Environment Major

Lecturer-Researcher in Physics

Thomas Raimbault
Industry 4.0 Major

Lecturer-Researcher in Information Systems

Mohamed Fillali
Supply Chain Management and International Transport Major

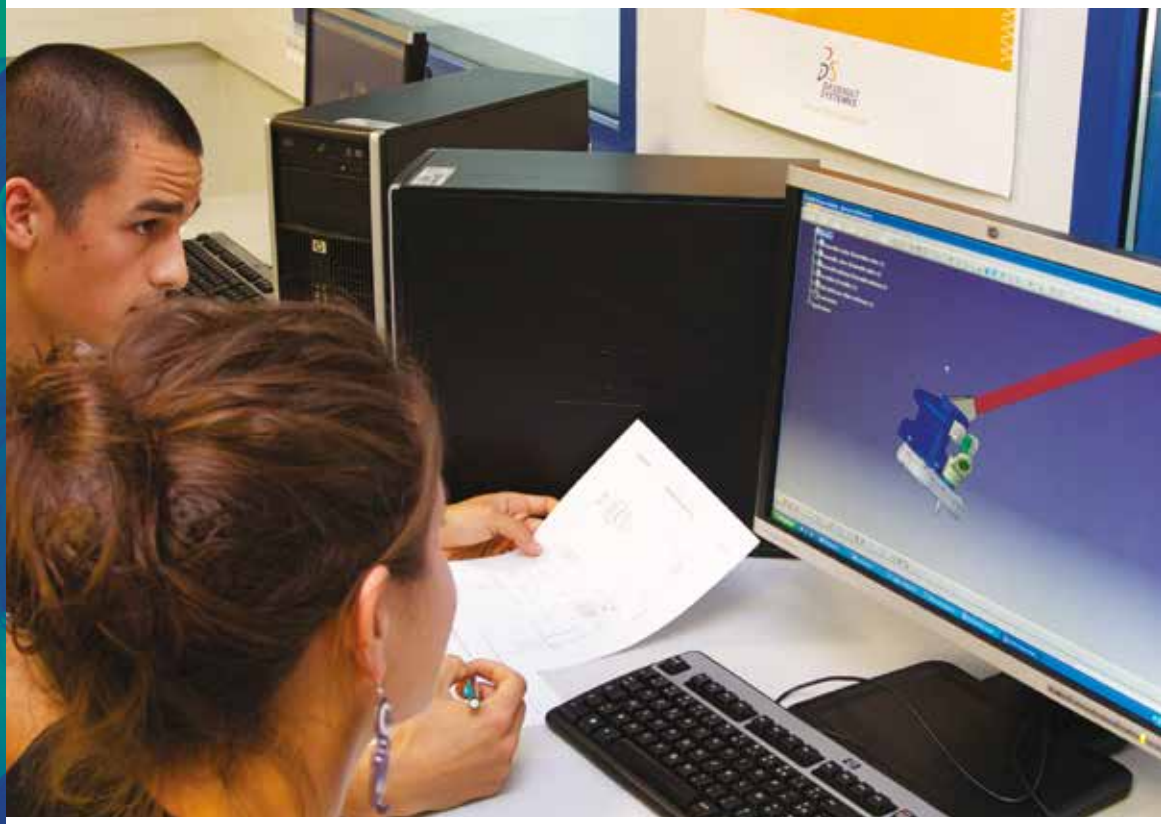
Lecturer in Industrial Management

Mechanics, Aeronautics & Systems

MECHANICAL DESIGN & INDUSTRIALIZATION

MECHATRONICS

INDUSTRIAL PERFORMANCE



Mechanical Design & Industrialization

Program Objectives

The objective of the "Mechanical Design and Industrialization" program is to train engineers who can design and industrialize new products, optimize existing products and adapt and improve production lines. Emphasis is also placed on developing methods for assessing, very early in the design phase, the consequences of technological choices in terms of resources needed to achieve the product.

Skills Acquired

- Analyse requirements and translate them into specifications in keeping with lean manufacturing principles.
- Draw and describe a mechanism, design, model and optimize it and develop a design file of the final system.
- Select the best materials for the product function.
- Assess financial and environmental issues in pre-planning stages.
- Industrialize products, imagine, design and optimize the production system.

Career Opportunities

- New product design and improvement of existing products: design office engineer, project manager, product development engineer, research engineer, testing engineer, etc.
- Production: process engineer, industrialization engineer, etc.
- Other related functions: Production engineer, quality engineer, maintenance engineer, technical sales engineer, purchasing engineer, etc.

Employment Sectors

The cross-disciplinary nature of the "Mechanical Design and Industrialization" program allows EIGSI engineers to work in all industrial sectors, including automotive, aviation, rail, aerospace, ship-building, energy, consumer goods, capital goods and recreational equipment.

LA ROCHELLE CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

General Design Methods (PLM)

- Product lifecycle concepts.
- Technical data management.
- Multipartner data exchange.
- Engineering methods.
- Methods and tools for simulation and optimization.
- Reverse engineering techniques.
- Eco-design concepts.
- Rapid prototyping techniques
- Virtual industrialization.
- Economic concepts.

Metal Materials

- Different families of metals.
- Characteristics of materials.
- Selection strategy, case studies.
- Examples of industrial application.

Structural Calculation

- Structural calculation concepts.
- Structural analysis case studies in CATIA and ANSYS:
  - Static, vibration and buckling analysis,
  - Dynamics,
  - Assembled system - contact management,
  - Structure of composite materials.
- Structural design micro-project.

Power Transmission

- Electric motors, gear motors and associated control components.
- Pneumatic systems, hydraulic power and associated control components:
  - Technologies,
  - Dimensioning,
  - Selection strategy, case studies,
  - Examples of industrial applications.

Processes, Processing and Controls

- Processes, routings, operating procedures, determine the cost price, calculate return on investment.
- Metal materials processing techniques: machining, forming, casting, assemblies.
- Non-destructive testing methods.
- Liquid-penetrant, X-ray, magnetic, ultrasound, vibration modes.

Virtual Industrialization Engineering

- Fields of application of virtual industrialization
- CAM studies (Computer Aided Manufacturing)
- DELMIA virtual industrialization software
- Analysis of an assembled product: assembly / disassembly study, accessibility.
- Design of an assembly station and workstation study (accessibility, operating time, ergonomics).
- Integration of operators, automated tools, robots.
- Analysis and improvements of workstations, setup times, ergonomics.
- CAM micro-project and a product assembly line micro-project.

Design Project

Part 1

- Develop a specification based on a general idea expressing a requirement.
- Imagine, design and dimension an appropriate solution, and then model the system with CATIA.
- Draw up a complete design file of the final product.

Semester 9

Optimization and Industrialization Project

Part 2

- Conduct an improvement and optimization process on the product designed in part 1 (Design Project) and update the design file.
- Perform the two following actions:
  - Make a realistic prototype to validate the essential functions of the final product,
  - Study the mass production of the product for a predefined volume and determine the cost price.
- Complement: become familiar with the ISO rating.

Advanced Modelling

- Two-part module:
  - a) Kinematic and dynamic modelling of articulated mechanical systems in CATIA and SOLID WORKS
  - b) Use CATIA "Surface Design" and "Knowledge Advisor" to model complex shapes and embed artificial intelligence in the models.

These two parts are followed by micro-projects.

Non-Metal Materials

- Choose the best non-metal material (TPE, rubber and composites) for each component of a mechanical system to meet the functional requirements of a system, taking into account the recyclability of each product, at an optimal cost.
- Different processing techniques of non-metal materials and how they are used based on the requirements of the product, the quantities to produce and cost targets.

Mechanical Design & Industrialization

Mechatronics

Program Objectives

The objective of the Mechatronics program is to train multi-skilled systems engineers able to:

- **Analyse a system to develop each component of the product, making the best choices throughout the project,**
- **Understand the interactions of fields such as electronics, informatics, control engineering, thermodynamics, optics, materials, etc.**
- **Resolve a wide variety of industrial problems, both in terms of products and processes, thanks to a solid general engineering culture.**

Skills Acquired

- Thorough understanding of mechatronic systems: energy exchanges, electromagnetic interactions, control systems (sensors, actuators, onboard computer, control strategies).
- Analyse, model and optimize complex mechatronic systems to achieve increasing miniaturization,
- Integrate different technologies within a mechatronic system in order to improve its performance.

Career Opportunities

- New product development: project manager (leading innovation projects), research and innovation engineer, design engineer, modelling engineer, product development engineer, test engineer.
- Production/System Design: process engineer, production engineer.
- Product/System Manufacturing: quality engineer, maintenance engineer, sourcing engineer.
- Sales: sales engineers.

Employment Sectors

Mechatronics engineers can work in many sectors: mechanical, electrical and electronic systems, computers, plastics, materials, machine-tools, home appliances, etc.

Obviously, the aerospace, automotive and telephony sectors are always looking to recruit mechatronics engineers.

LA ROCHELLE CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

Introduction to Mechatronics

- Definition of mechatronics. Structure of a Mechatronic System.
- Mechatronic approach. Physical and functional integration.
- Importance of mechatronization.
- Problems caused by mechatronization and solutions.
- Application of concepts on a mechatronic system.

Components and Control Systems

Part 1

- **Embedded systems**: constitution of embedded systems (definitions, examples, specific features), types of existing systems, selection criteria and applications.
- Introduction to development tools for programming an embedded system in C. Introduction to C programming language
- Controlling an autonomous mobile robot.
- **Representation of system status,** time responses of multivariate systems, controllability and observability, stability control of multivariate systems, position control of an Electromechanical Actuator

Multiphysics Aspects

Heat dissipation in mechatronic systems:

- Review of the fundamental laws of heat transfer. General presentation of heat dissipation solutions suitable for mechatronic systems.
- Specific study (design, dimensioning, thermal-electrical analogy) of cooling techniques for temperature control:
  - Cooling fins (geometry, thermal resistance, efficiency).
  - Passive two-phase thermal control systems (wall nucleate boiling, thermosyphons and heat pipes).

Electromagnetic compatibility (EMC):

- Fundamentals, standards and guidelines.
- Types of electromagnetic interference, coupling in large systems.
- Some EMC components, EMC instruments, finite element method modelling applied to EMC.
- **Design of multiphysics systems** (material, thermal, electromagnetic aspects): modelling of coupled physical phenomena, simulation and design to meet specifications.

Dynamic Behaviour

Part 1

- **Bond Graphs:** Bond graph terminology, bond graph model building procedures, causality, switching from a bond graph to a block diagram, mathematical models developed from a bond graph, structural properties, contributions of the bond graph tool, description of the language and how it applies to different areas of physics.
- Applications to various areas of engineering: mechanics, fluid power, electrical and electromagnetics, thermodynamics, etc.

Modelling and simulation of mechatronic systems:

- Implementation of a model-based design approach using AMESim simulation software.
- Application to the modelling of a hybrid engine system.

Mechatronics

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 9

Components and Control Systems

Part 2

- **Micromechatronics:**introduction to micro-mechatronics, value of active materials in micropositioning (thermal shape memory alloys, piezoelectric actuators, electrostatic actuators, thermal actuators).
- **Behavioural Modelling:** applications of this type of modelling, process, identification methods (recursive or not), influence of the measurement noise on the quality of identification, practical aspects, software tools.
- **Application:**implementation of the V-cycle of a mechatronic system: study of components and modelling of the physical system, determination of the control algorithm, simulation, real-time implementation and testing.
- **Design of a Mechatronic System:** design of the components and the control of an industrial mechatronic system: AGV (Autonomous Guided Vehicle).

Complex Systems Engineering

- **System Engineering:** issues, concepts, system modelling, introduction to the SysML modelling language, case study.
- **Management of Multidisciplinary Teams:** decision making, individual behaviour and group behaviour, use of intermediate representations, decision-making from the sociological standpoint.
- **Simultaneous Engineering:** industrial challenges for the management of technical data, data flows VS business processes, product engineering, flow of technical data, processing tools for technical data.
- **PLM:**feasibility study of a PLM project, implementation of a PLM project, orientation of a PLM project towards gains, PLM by business sector, people at the heart of PLM, Infrastructure Architecture and security, introduction to a PLM tool.
- **Technical Innovation:** analysis of the physical and technological principles that have helped solve recurring problems in the past, use of evolutionary trends that guide product development.
- **Design For Six Sigma:** presentation of this method through examples, case study on a mechatronic system.

Dynamic Behaviour

Complex Systems Modelling:

- **Product Lifecycle:** from inception to end of life.
- **Modelling:** what are models and why do we make them?
- **Simulation:** what is simulation and what is it used for?
- **Projections:** what changes are in store for the mechatronics engineering profession?
- **Application:** Case study / role play regarding the design approach of a complex system (autonomous vehicle).

Mechatronics

Industrial Performance

Program Objectives

Companies must continuously improve their industrial efficiency, both at production sites and throughout the value chain, from sourcing to distribution of products and services.
They also need to adapt to new economic and legal constraints, deal with new market conditions (shifting consumer markets) and maximize their competitive advantage.

The objective of the Industrial Systems Engineering and Management program is to train engineers who are:

- **Operational along the entire supply chain, including production.**
- **Able to design, implement, manage, maintain and improve complex industrial systems, integrating technical, organizational, financial and human factors.**

Skills Acquired

- Model, configure and simulate a global supply chain, from suppliers to customers,
- Assess the performance of a production line (or sector) in terms of safety, quality, volume, time and cost,
- Develop an improvement plan to address the problems identified.
- Lead a working group to implement the improvement plan, by providing technical and organizational solutions.

Career Opportunities

- Process Engineer: optimize the production processes of the company. Improve the rate of availability of production equipment and simplify the operations performed for efficient, superior quality work at the lowest cost.
- Production Engineer: manage a team and coordinate the various production sequences involved in manufacturing a product. Manage production and make decisions in accordance with quality, deadline and cost requirements.
- Logistics Engineer: improve the interactions of the various components involved in the business activity. Optimize the business workflows using "just in time" principles.

Employment Sectors

The multidisciplinary nature of the "Industrial Performance" program enables EIGSI engineers to work in all sectors: automotive, rail, ship-building, aerospace, capital goods, etc.

LA ROCHELLE CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

Strategic Tools
- Basic principles of business strategy.
- Apply global business strategy in an industrial setting.
- New concepts in industrial strategy.
- The genesis of an industrial strategy: the inventor of the Toyota system.

Purchasing
(sourcing and negotiation)
- Make or Buy strategies, Sourcing and globalization / Low Cost strategies.
- Partnerships (Risk Sharing) / Co-Design, Co-Industrialization.
- Customer / supplier relationships.
- Strategic purchasing.
- Supplier panel management.

Production System Organization and Management
- The modern approach to production management.
- The theoretical principles of planning: Sales & Operations Planning, Manufacturing Planning and Scheduling.
- The organization of production lines.
- Graph theory, Petri nets.

Processes and Maintenance (support functions)
Part 1
- Industrialization Function.
- Maintenance Function.
- TPM.

Lean Management
Part 1
- Lean Manufacturing concepts and tools.
- Lean Management and Continuous Improvement.
- SMED, standardized operations, Kanban.

Transportation Organization and Management
- The commercial contract and shared transport between seller and buyer.
- Transport operators.
- Purchasing transportation and implementing a transport operation.
- Purchasing logistics services.

Industrial Audit – Management System
Part 1
- The quality system.
- The standards (QHSE, ISOTS, EN9100, IRIS, etc.).

ERP
(enterprise resource planning)
- Implementing an ERP (SAP).
- Order processing in SAP – associated risks.
- Flow control.
- Cost control.

Semester 9

Industrial management control
- Roles and functions of the industrial management controller.
- Analysis of costs and variances.
- Control and communication tools: the dashboard.
- Planning and control tools: the budget.
- Reporting: roles and responsibilities.

Processes and Maintenance
Part 2
- Managing special processes in an industrial company.
- Standards for special processes.

Industrial Audit - Management System
Part 2
- Set up a metric study of the standards.
- Audit a business process on-site.

Lean Management
Part 2
- Lean Manufacturing concepts and tools.
- Management and Continuous Improvement.
- Change management
- Lean 6 Sigma, Lean Office, Hoshin.

Supply chain management
- Modelling the Supply Chain.
- Optimizing the global chain.
- Modelling the physical system, flow simulation (witness, basics, Wipsim).
- Flow simulation.

Decision Modelling
- GRAI method (Graph with Results and Activities Interrelated).
- Designing a performance indicator system.

Industrial Performance

semesters 8 and 9

Team building
- Team management.
- Group dynamics.

Digital Engineering

GREEN COMPUTING

ARTIFICIAL INTELLIGENCE & BIG DATA

HEALTHCARE SYSTEMS ENGINEERING

Green Computing

Program Objectives

Today, digital technology is undeniably the backbone of our society. The massive use of digital services and user devices has considerable social, environmental, political and economic impacts.
The goal is not to question the value of digital technology in our society, but rather to control the underlying impacts of digital systems. By applying sustainable development efforts to digital technology, we can provide the tools, methods and processes to move towards green computing. The objective of the Green Computing major is to train engineers who are able to:

- **Lead a green computing policy**
- **Eco-design, implement and supervise a digital system**

Skills Acquired

- Understand the digital ecosystem, the associated technologies and propose digital solutions and eco-designed architectures.
- Understand the enterprise ecosystem in order to implement green computing policies in companies.
- Lead and implement a green computing policy/project.
- Eco-design and/or lead a digital system or a technology.
- Measure the impact of digital technology over its entire life cycle.
- Supervise and administer an information system.

Career Opportunities

- Enterprise architect: they establish an organization's IT infrastructure and update IT hardware, software and services to help achieve established enterprise goals.
- Application Architect: they provide the specifications and overall architecture of an application.
- Information Systems Architect: they define the architecture of a computer system.
- CSR Officer: they ensure compliance with ecological, ethical and social standards.
- IT CSR Project Manager: they are tasked with specific projects, for example, implementing a Green Computing policy on a software solution.

Employment Sectors

EIGSI Green Computing engineers can work in all sectors of activity:
industry, IT consulting, banking, etc.

LA ROCHELLE CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

Green Computing
- Sustainable development.
- Green Computing certification.
- Standards and best practices.

Digital Ecosystem
Part 1
- Connected networks and systems.
- Information Systems Architecture.
- Information Systems Urbanization.
- Business Intelligence and Green Computing performance indicators.
- Data centers and Cloud computing.

Software technologies
- Web Technologies.
- Software engineering.

Life Cycle Assessment (LCA)
- LCA methodology.
- LCA of digital services.

Projects
- Multidisciplinary green computing project.

Semester 9

Digital Ecosystem
Part 2
- Eco-designed digital architecture.
- Information Systems Audit.
- Supervision.

Green code and software quality
- Eco-design.
- Measurement tools.

Innovative technologies
- Artificial Intelligence.
- Blockchain.
- Cryptocurrency.

Economy and society
- Economic issues and green computing.
- Circular economy.
- ROI.

Projects
Part 2
- Multidisciplinary green computing project.

Green Computing

Artificial Intelligence & Big Data

Program Objectives

Artificial Intelligence and Big Data are driving a profound transformation in the use of digital technology by companies of all sizes and in all sectors. With this transformation, new professions are emerging, while others are being transformed.

The objective of the "Artificial Intelligence and Big Data" major is to train generalist engineers to use the methods, tools, processes and solutions necessary to exploit big data.

The graduates will have a global view of all the issues, ranging from data governance for ecosystem value creation to artificial intelligence solutions, enabling them to correctly and efficiently understand the volume, heterogeneity and complexity of big data.

EIGSI generalist engineers will have the technical skills and methods needed to leverage data to drive business strategy.

Skills Acquired

- Harvest big data and classify information according to the company's needs.
- Leverage data for all functions in the company.
- Participate in defining the Data-Driven strategy.
- Communicate with teams in order to provide solutions to business problems involving large amounts of data.
- Manage Big Data projects.

Career Opportunities

Data Analyst
Data Scientist
Data Engineer
Data Architect
Chief Data Officer
Master Data Manager
Data Miner
Business Analytics Engineer

Employment Sectors

All business sectors are impacted by the big data revolution. Companies of all sizes need data management, in fields including aerospace, automotive, astrophysics, healthcare, energy, marketing, banking and insurance, finance, logistics, agriculture and food processing, tourism, etc.

CASABLANCA CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

Data Ecosystems

Part 1

- Introduction to Big Data.
- Introduction to NoSQL databases.
- Data governance
- Business Intelligence (BI): data warehouse and ETL.
- Cloud computing / data center.
- Internet of Things (IoT).

Artificial Intelligence AI

Part 1

- Introduction to Artificial Intelligence.
- Statistics and probabilities (data analysis).
- Algorithmic models.
- Optimization.

Data Analysis and Visualization

- Principles of Data Viz (data visualization).
- Data Viz tools: table, D3.js, qlik, SAS.

Security and Ethics

- - Data security and Cybersecurity.
- Data quality.

Project Management

Part 1

- Principles of Agile management and preparation for certification.
- Identify the main components of a business project and the roles involved.
- Project planning and workload management.
- Build and monitor a project budget dashboard.

Semester 9

Data Ecosystems

Part 2

- Personal data protection and privacy in different cultures.
- Data in the age of Green Computing.
- Organizational impact of the data-driven transformation and practical applications.
- General introduction to Digital Humanities.

Artificial Intelligence AI

Part 2

- Machine learning, Deep learning.

Knowledge Management

- Knowledge management: theory and technique.
- Web semantics and ontologies.

Artificial Intelligence AI

Part 3

- NLP (Natural Language Processing).
- Image processing.

Project Management

Part 2

- Preparation for certification (part 2).
- Monitor project risks.
- Understand indicators to assist in decision making.
- Manage and communicate as project leader.
- SCRUM and KANBAN processes.

Healthcare Systems Engineering

opening in 2022

Program Objectives

Healthcare systems are constantly evolving to meet societal, epidemiological and demographic challenges. The W.H.O. has indicated that advances in technology – new drugs or diagnostic tools, for example – can improve healthcare and the overall performance of healthcare systems. The objective of the Healthcare Systems Engineering major is to train students to work in the healthcare ecosystem, by acquiring scientific, technical, regulatory and methodological skills. EIGSI generalist engineers with a major in healthcare systems engineering can find work in public or private hospitals, companies in the healthcare and pharmaceutical industry, and public or private research laboratories. They make use of engineering tools and processes in a healthcare or industrial setting, to improve patient care and support healthcare professionals.

Skills Acquired

- Understand and work in a healthcare ecosystem.
- Understand the healthcare market.
- Manage a healthcare / e-healthcare project.
- Identify and act on the drivers of a healthcare project.
- Understand healthcare information systems and governance.
- Implement solutions based on new technologies and AI.

Career Opportunities

- Healthcare / e-healthcare project manager.
- Clinical Transformation Management Engineer.
- Hospital engineer.
- Manager / Director of Operations in a hospital setting.
- Technical sales engineer in the healthcare industry.
- R&D engineer.

Program description:

The program focuses on the following areas:

- Engineering sciences related to the healthcare field.
- Healthcare ecosystem.
- Technologies and digital transformation in healthcare.
- Information processing.
- Management and regulatory issues.

LA ROCHELLE CAMPUS

Sustainable Energy Systems, Construction & Transportation

CONSTRUCTION & PUBLIC WORKS

ENERGY & ENVIRONMENT

Construction & Public Works

Program Objectives

This program trains general engineers to work in the field of civil engineering, giving them the knowledge needed to design and engineer construction and public works projects.

This major provides polytechnical, multidisciplinary and hands-on training, to prepare future graduates for the specific needs and demands of the construction and public works sectors.

Skills Acquired

- Preliminary plans for construction projects.
- Engineering of construction projects.
- Project costing.
- Construction site supervision for civil engineering projects.
- General contracting.
- Development of maintenance plans.

Employment Sectors

- The broad nature of the Construction and Public Works major trains EIGSI engineers to work in all sectors: engineering firms, construction companies, building materials industry, civil engineering consulting, construction and geotechnical laboratories and construction site management and supervision.

Career Opportunities

- Engineer in a design office.
- Engineer in consulting and control.
- Engineer in a testing laboratory.
- Engineer in project management.
- Engineer / entrepreneur.
- Engineer in scheduling, planning & coordination.

Teaching Staff

- 80 % are construction industry professionals with degrees from French and Moroccan *Grandes Ecoles* (ENPC, ESTP, ENTPE, EMI, EHTP) who hold management positions in national and international companies.

CASABLANCA CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

General construction processes

- Understand trades involved in finishing work, in addition to structural work and worksite organization (power, drinking water, sewer system).

Topography

- Techniques used for topographic surveys of the terrain.
- Direct applications of these techniques and their importance in urban development and public works projects in general.

Reinforced Concrete Structures

- Design calculations and best practices for designing sections of reinforced concrete according to BAEL rules.
- Calculation, design and verification of components of reinforced concrete structures.

Roads & Utilities

- Basic concepts related to the geometric design of roads.
- Techniques pertaining to designing and installing utilities and roadways in subdivisions.

Geotechnics

- Define physical soil characteristics and determine soil classification.
- Dimension the foundations of a civil engineering structure.

Acoustic and Thermal Environment

- Basic concepts of acoustics and thermal comfort in buildings.
- Technologies of acoustic and thermal insulation of constructions.

Project Design

- Construction and public works project design methods.
- Satisfy the requirements expressed in the construction program.

Semester 9

Engineering structures

- Basic design principles of bridges and their components.
- Different bridge structures and the techniques used to build them.

Earthquake Engineering

- Analytical and numerical methods for calculating the dynamic response of structures subjected to seismic stresses.

QHSE

- Knowledge and tools to address pollution problems and perform environmental impact studies to limit the negative impact of large infrastructure projects
- Quality and safety systems in construction projects.

Water Engineering

- Basic principles of hydrology and hydraulics and their applications in the field of public works.
- Design and dimension hydraulic structures and sewer systems.

Construction Project Management

- The basics and culture of project management to be able to take part in or actively lead a project team.
- Dimension and optimize the resources needed for a project.

Construction Cost Estimating

- Construction cost estimating concepts and the roles of the people involved.
- Financial and administrative aspects of a construction contract.

Building Information Modeling (BIM)

- Fundamentals of BIM and its importance in construction projects.
- BIM software for the design, modelling and management of complex projects.

Energy & Environment

Sustainable Housing Option
Sustainable Mobility Option

Program Objectives

Today's businesses are well aware that sustainable development issues such as energy and environmental management can give them a competitive edge in an increasingly demanding regulatory environment. New markets and new innovative sectors lead to new career opportunities.

The objective of this program is to train engineers to:

- **design, integrate and run systems for the exploitation, conversion and storage of various forms of energy,**
- **assess the energy and environmental efficiency of complex systems, especially in the building and transportation sectors, and recommend solutions for improvement,**
- **optimize all business activities related to the production, distribution and consumption of energy and improve the performance of new energy sources, keeping in mind user expectations and environmental issues.**

The program has a core curriculum and then focuses on either sustainable housing or sustainable mobility.

Skills Acquired

- Expertise in technical, financial and environmental analysis tools in various fields of energy.
- Conduct energy efficiency assessments providing solutions to improve energy transformation and storage.
- Implement alternative solutions in industry, construction and transportation sectors,
- Apply a global multi-criteria, multi-actor approach to analyse the context of potential energy use and quantify the energy, environmental, financial and societal impacts.

Career Opportunities

- Projects: key account engineer, project manager for energy systems, energy efficiency project manager.
- Design and Research: design engineer or researcher responsible for designing energy systems or innovative sustainable mobility projects.
- Implementation: site supervisor for innovative facilities and equipment, technical inspections.
- Strategy: environmental or energy consultant in various sectors.

Employment Sectors

Engineering students who major in "Energy & Environment" can find work in France and abroad in all sectors related to energy, either directly in the production, storage and distribution of different forms of energy, including renewable energy; or indirectly in green building or sustainable transportation. They can also work in environmental sectors (design, operation, standardization, accreditation).

LA ROCHELLE CAMPUS

Detailed program

Sustainable Housing
Sustainable Mobility

180 HOURS
15 ECTS EARNED EACH SEMESTER

Semester 8

Common core of the sustainable housing and sustainable mobility options

NON-RENEWABLE ENERGY

Fossil fuels
(lectures, tutorials, project)

- Processes involved in exploiting and refining fossil resources, the state of resources, global energy demand.
- Prospective analysis of energy consumption by 2025.
- Applications for aeronautical propulsion.
- Consequences of the use of non-renewable energy sources on the geopolitical equilibrium and the environment.

Nuclear power
(lectures, project, site visit)

- The physical principles of nuclear fission, chain reaction and enrichment.
- The nuclear fuel cycle, the various generations of reactors.
- Standards on nuclear safety, radioactive waste storage and treatment processes, dismantling of nuclear power plants.
- Other applications and prospects for nuclear energy and the state of resources worldwide.

RENEWABLE ENERGY

Solar, photovoltaic
(lectures, tutorials, labs, site visit)

- Solar potential, different photovoltaic technologies.
- Photovoltaic system manufacturing technology, the types of cells, recycling.
- Design of a photovoltaic system, return on investment.
- Photovoltaic project.

Solar, thermal
(lectures, labs, tutorials, site visit, project)

- Components of a solar thermal system (collectors, storage system, circulation system).
- Different types of systems and collectors.
- Design and performance of a project in accordance with regulations.

Wind power
(lectures, tutorials, site visit, project)

- Wind technology: the components of a wind power system, the principle of wind turbines.
- Different types of wind turbines.
- Site selection and project development, in accordance with regulations.

Biomass, biogas
(lectures, tutorials, site visit)

- The technical aspects of exploiting wood energy and biogas sectors, scope, environmental impacts, regulatory issues and the particularities of project development and prospective studies.

Geothermal
(lectures, tutorials)

- Applications of high and low temperature geothermal resources, depending on soil temperature, geothermal gradient, soil properties.
- Various low temperature systems (open and closed loop, horizontal and vertical systems).

Hydraulic power
(lectures, project)

- Hydraulic dam construction techniques: general information, engineering, hydraulic studies, hydroelectric machinery, instrumentation and control tools, spillway, energy dissipator basin.
- Pumping stations.
- Tidal turbines and marine energy systems.
- Cost and use of hydropower, environmental consequences and ecosystems.

EIGSI's Energy & Environment Program is accredited by the Format'eree quality label

Energy & environment

Detailed program

Sustainable Housing
Sustainable Mobility

Semester 8

Common core of the sustainable housing and sustainable mobility options

Energy &

ENERGY CARRIERS

Transport, distribution and consumption of electricity
(lectures, tutorials, site visit, project)

- The general system of production, transmission and distribution of electricity, stations and substations (transformer, distribution), transmission lines, distribution systems, the structure of a transformer station (HV/LV).
- Dispatching, load forecasting, network configuration in case of disruptions.
- Smart grids, the benefits for the network, impacts on energy efficiency and GHG reduction.

Hydrogen
(lectures, tutorials)

- Operating principles and challenges involved in fuel cell technology, in particular proton exchange membrane fuel cells (PEMFC).
- Physical phenomena associated with fuel cell operation (thermodynamics, kinetics) and test systems.
- Application examples: automobiles, buses, demonstrators.
- Studies conducted on SOCs (solid oxide cells), operating principle, electrochemistry and materials; applications and development prospects.

DESIGN OF ENERGY SYSTEMS

Modelling of energy systems
(lectures, tutorials, labs, project)

- The challenges of modelling energy systems, relationships between design variables and performance variables.
- Case studies: boiler, heat exchanger, solar panel, etc.

Multi-objective optimization
(lectures, labs, project)

- Techniques for determining Pareto sets.
- Methods of analysis and optimization (Chebyshev, weighted sum and lexicographic method).
- Application to transport propulsion systems and energy production systems in buildings.
- Validating a model and its range, model sensitivity study and parametric analysis.

ENVIRONMENT

Waste management and treatment
(lectures, tutorials, site visit)

- Types of non-hazardous and hazardous waste, regulatory issues.
- Choice of treatment process (disposal/recycling) and local implementation.

Atmospheric pollution
(lectures, labs)

- The physical and chemical processes of pollution, long-term evolution of pollutants.
- Regulatory issues in the field of air pollutants.
- Total emissions across sectors and pollution degrees.
- Methods and tools to analyse the pollution degree (experimentation, modelling).

180 HOURS

15 ECTS EARNED EACH SEMESTER

Common core of the sustainable housing and sustainable mobility options

PERFORMANCE OF ENERGY PROJECTS IN BUILDING AND TRANSPORTATION

Managing energy projects
(lectures, tutorials, project)

- Specific issues in managing projects involving complex energy systems.
- Specific methods and tools for managing projects involving these systems in the building and transportation sectors.

Environmental performance
(lectures, labs, project)

- Circular economy, product LCA.
- Develop a carbon footprint assessment and identify potential for improvement.
- Air quality, noise pollution, the main issues involved, associated magnitudes; measurement and modelling methods (building and transportation).
- Types of chemical pollutants, transfer to soils and groundwater.
- Integrated approach to the impact of an industrial site (IPPC Directive).
- Wastewater treatment plant, distribution networks, treatments designed for specific types of contamination.
- Regulatory issues and environmental standards.

Value analysis and target-cost design
(lectures, tutorials, project)

- The project management phases based on a predetermined target ceiling cost and open and negotiable functional specifications.
- Design of a new product with a target production cost (compliance with technical performance within an allocated budget).

Engineering design project
(multidisciplinary project in either sustainable housing or sustainable mobility)

- Multidisciplinary project run from start to finish via a joint multi-objective and multi-actor approach integrating technical, environmental and financial performance (assessment phase, technical proposals and/or societal gains).
- Applications to building renovation and urban mobility projects in La Rochelle and surrounding areas.

nvironment

Energy & Environment

Sustainable Housing Option

Thermal systems and HVAC in buildings
(lectures, tutorials, labs, site visit, project)

Energy, environmental and regulatory issues in energy efficient buildings. Heat exchange between the body and the environment, concept of thermal comfort and thermo-equivalent conditions. Thermal air handling for comfort and regulatory issues. Influence of ventilation on energy load, thermal comfort, acoustics and indoor air quality of a building.

Thermal bridges, leaks, losses: characterization and design of walls, windows, various types of ventilation and air conditioning systems.

Thermal modelling of exchanges: finite difference method, response factors method, simplified method, surface exchanges (theoretical, experimental and software simulation approach for static and dynamic behaviour).

Decentralized production
(lectures, tutorials, project)

Solar and geothermal applications in the building sector. The heating and hot water needs of a building, the main calculation variables, characterization of components: solar thermal collectors, solar water heaters, storage tanks.

Examples of applications: individual solar water heaters, district heating, heat pumps, cogeneration, trigeneration and applications in the building sector.

Operating principles of certain combined systems applied to buildings (fuel cells, solar thermal and solar photovoltaic, wind power).

Quality in buildings
(lectures, tutorials, labs, project)

Conduct an energy audit in a building, develop energy control procedures. European environmental certifications. High Quality Environmental standard for green building in France. Implementing an energy efficient building project in a multi-criteria and multi-actor context.

Energy & Environment

Sustainable Mobility Option

Architectures for light and heavy engines
(lectures, tutorials, labs, site visit, project)

Combustion engines (architecture, combustion efficiency, mechanics). Local pollution regulations, pollution control solutions, alternative fuels and post-treatment systems for gas and particulate emissions.

Energy management and storage systems, new electrochemical energy storage technologies and super-capacitors.
The principles and architectures of electric and hybrid transmissions (storage systems and converters, coupling systems, types of couplings for hybrid vehicles, advantages and disadvantages, examples of achievements).

Designing a hybrid or electric motor using a theoretical approach and software simulation.

Technology and specific issues involved in mechanical/automatic transmissions for HGVs and boat engines.

Different perspectives: gas engines and cogeneration, alternative fuels, biogas, waste recycling.

Aeronautics: powered flight. Generation of lift, selection criteria for the wings, aircraft control and stability, structures and architecture, materials, dimensioning and design. Propulsion systems (propeller, jet engines, modern propulsion technologies)

Operating principles of aircraft, gas turbines and aeronautical combustion chambers.

Using the tramway and the TGV high speed train as a case study: overview of the history, techniques, policies, systems and components of a rail system.

Environmental labels. Transport policy (passenger rail).

Technological improvements in combustion chambers: preferred strategy for compliance with ICAO regulations (reduction in specific fuel consumption and primary pollutants, with no performance degradation)).

Sustainable mobility
(lectures, tutorials, site visit, project)

Interactions between urban planning and mobility, impacts on the transportation of passengers and goods.

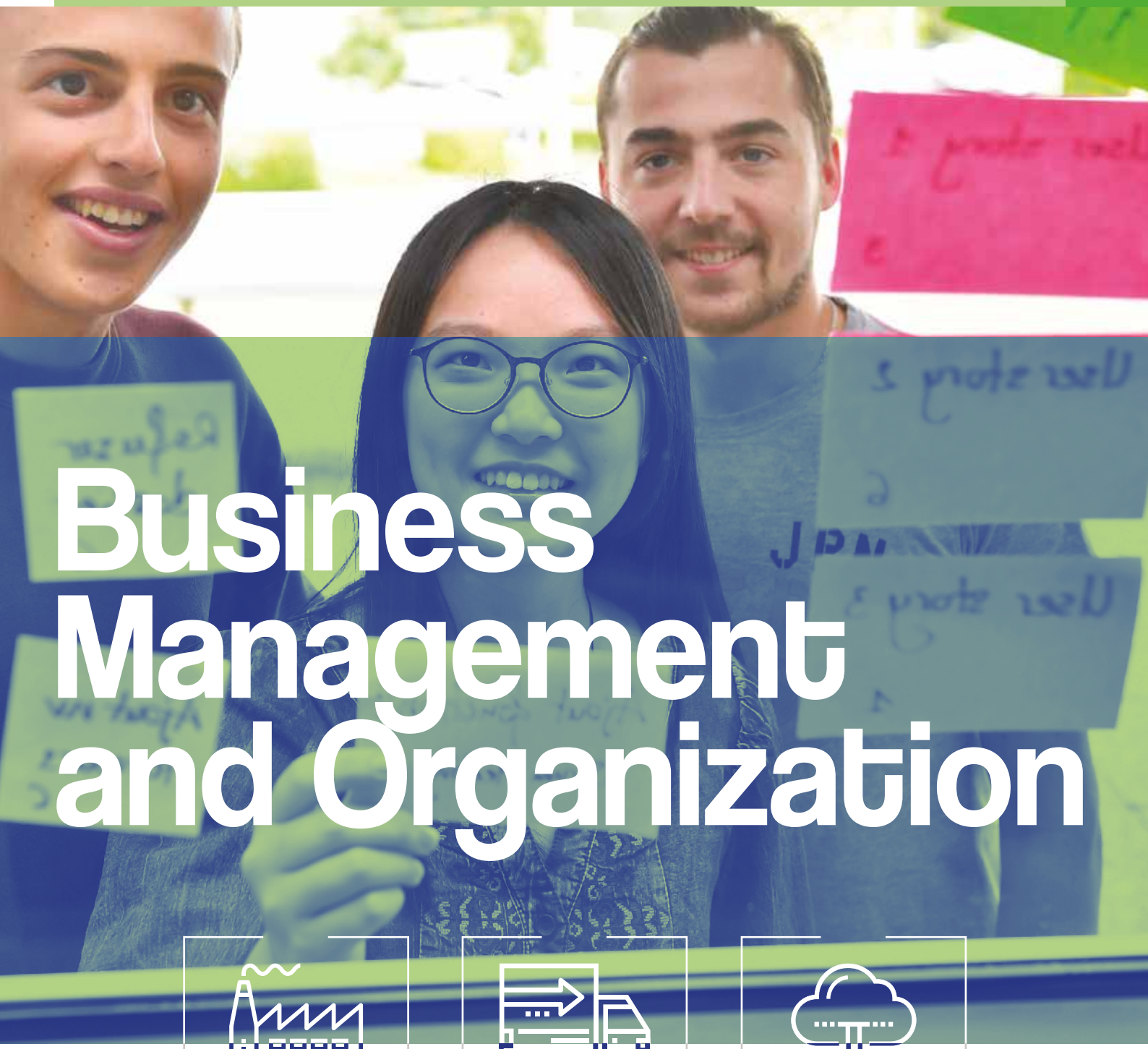
Modelling behaviours.

Using information systems to improve green mobility.

New transportation and information methods.

Understand the concept of Supply Chain Management, its applications for sustainable transportation for the business and transportation sectors.

Implementation of a mobility project for passengers or goods (multi-actor and multi-criteria context).



Business Management and Organization

INDUSTRY 4.0

SUPPLY CHAIN MANAGEMENT & INTERNATIONAL TRANSPORT

NETWORK ARCHITECTURE & INFORMATION SYSTEMS

Industry 4.0

Program Objectives

EIGSI's Industry 4.0 program is designed to meet the needs of companies that want to improve their overall or specific performance, by helping to implement efficient solutions based on three levers, namely digitalization, customer centricity, and organizational and strategic transformation.

These engineers will work on production sites or throughout the value chain, from sourcing to distribution of products and services.

Skills Acquired

Strategic and operational skills, in particular in industrial engineering and logistics.
In additional to digital skills, skills in project management, team management and managing change brought about by improvement processes on the technical, financial and human aspects.

EIGSI engineers are able to:

- assess the company's organizational effectiveness throughout the value chain,
- model, simulate and optimize the entire life cycle of individualized products and services where the customer is a central actor,
- design, select and implement digital systems that ensure an efficient production system in the company, and instant interoperability between the company and its environment,
- propose a synergistic integration of human resources, technologies and standards to meet the company's future needs,
- orchestrate the changes necessary for sustainable performance.

Career Opportunities

Chief Digital Officer (CDO), Production Engineer, Process Engineer, Logistics Engineer, Quality Engineer, Migration Engineer, Supply Chain Manager, Continuous Improvement Engineer, Demand Planner, Data Analyst.

Employment Sectors

The multidisciplinary nature of this program enables EIGSI engineers to work in all sectors: industrial sectors (Smart Factory) from Aerospace to Food Processing, Business and Public Services (Transport, IT, Engineering), Energy (Smart Grid), Retailing and e-commerce, Health (hospital logistics, Smart Healthcare), Banking and Insurance, Construction (BIM and Smart Building).

LA ROCHELLE CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

Big Data Storage and Access

- What a NoSQL system brings to a traditional relational data storage system.
- Choose the right NoSQL solution for the types of data to be managed and the expected uses.
- Set up an efficient NoSQL solution.
- Query data in a NoSQL system.

Big Data Analysis & Forecasting

- Statistical and computational data analysis.
- Implement a data analytics strategy.
- Select and pre-process accurate and useful data to be analysed.
- Supervised and unsupervised machine learning techniques.

Networks

- IT network operating principles.
- Protocols and services associated with Internet networks.
- Routing protocols and address filtering techniques.
- Define the architecture of a local network.

Cybersecurity

- IT system and network vulnerabilities.
- Implement an information security policy.
- Set up the technical and organizational systems to combat system and network threats.
- Detect, analyse and qualify incidents, threats and attacks.

PLM - Product Lifecycle Management

- Implement a product lifecycle management strategy covering processes and actors.
- Manage multi-disciplinary technical data and configurations.
- Dematerialize and anticipate product modifications.
- Ensure compliance with quality, safety and environmental standards.

CRM - Customer Relationship Management

- Basics of relationship marketing: measurement, analysis and segmentation.
- Implement a strategy to guarantee customer satisfaction.
- Implement a customer acquisition and retention strategy.
- Measure and analyse the performance of the actions carried out.

Customer focus in Industry 4.0

- Design or transform a company with customer-centric organizational strategies and business models. (100% project).

Industry 4.0

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 9

Cloud

- Cloud computing models (IaaS, PaaS, SaaS, FaaS, DaaS, etc.)
- Major players and public, private or hybrid cloud solutions.
- Develop a Cloud solution for infrastructures, services and data.
- Deploy, provision and maintain an operational Cloud solution.

Data Visualization

- Different modes of data visualization (semiotics, visual representation).
- Identify and anticipate representation difficulties.
- Produce a visual representation suitable for the data being analysed.
- Justify your choices, your analyses and the representations produced.

Business Intelligence

- Analyse an existing information system and the needs of the users.
- Develop a BI strategy for the company.
- Design a multidimensional model for data mining.
- Query a multidimensional model.

Industrial IoT (IIot) Networks

- Network and telecommunications technologies for IoT.
- Standards, industrial alliances and platforms for IIoT.
- Design an IoT infrastructure for the company.
- Configure and simulate an IoT solution from end to end.

ERP - Enterprise Resource Planning

- Model vertical information flows.
- Integrate different flow management modes.
- Choose and configure an ERP for product lifecycle management, supply chain management and customer relationship management.
- Identify critical tasks and milestones, sustain gains and promote continuous improvement.

Supply chain & Lean Management

- Model a global supply chain, from suppliers to customers.
- Configure and simulate a supply chain.
- Assess the efficiency of a production line (safety, quality, volume, time and cost issues).
- Build a continuous improvement or optimization plan.

Architecture & Administration of an Industry 4.0 Enterprise

- Design, transform and orchestrate the transformation of the company's organization, strategies and economic, social and environmental models to offer tailor-made products and/or services. (100% project).

Industry 4.0

Supply Chain Management and International Transport

Program Objectives

This major trains generalist engineers capable of meeting the needs of the logistics sectors in France, Morocco, Africa and worldwide. Graduates will be able to work in senior positions involving supply chains and international transport.

They will have the following capabilities:

- **Establish and share a forward-looking vision**
- **Join, lead and develop a team (coordinate supply chain entities)**
- **Anticipate (advance planning)**
- **Make quick decisions**

The major is designed around 4 key areas:

- **Strategic supply chain issues**
- **Supply chain design**
- **Supply chain management**
- **International transport operations**

Skills Acquired

Strategic skills

- Understand organizational strategies and embrace their cultures.
- Understand the dimensions and scope of supply chains and think globally without ignoring local issues.
- Develop and plan supply chain strategies that are aligned with organizational strategies.
- Design and link supply chain structures and processes.
- Embrace technological progress and be part of the digital transition to digitalized supply chains.
- Embrace social responsibility and set up and operate sustainable supply chains.

Organizational skills

- Organize and manage supply chain entities to satisfy internal and external customers and make optimal use of the resources available.
- Understand the environment in which supply chain activities are carried out and adapt to changes.
- Utilize multidisciplinary skills to synchronize logistics chains and achieve optimal operation.
- Set up information systems capable of providing the indicators needed for monitoring and advance planning.
- Develop and manage supply chain projects with agility, and leverage knowledge to drive continuous improvement
- Manage physical flows involving international transport, in accordance with safety standards and cost-effectiveness criteria, while minimizing the negative impact on the environment and stakeholders.

Career Opportunities

Supply chain director, supply chain manager, sourcing logistics manager, distribution logistics manager, sourcing manager, fleet manager, transit manager, many future-oriented jobs involving digitalization, sustainable logistics, urban logistics and reverse logistics, consultant.

Employment Sectors

Engineers who major in Supply Chain Management and International Transport can work in France or abroad in all sectors requiring supply chain sourcing and the transport of goods, merchandise or products. They may consider a career in industry (assembly lines), or with logistics service providers, freight carriers, cities, public administration, etc.

CASABLANCA CAMPUS

Detailed program

180 HOURS

15 ECTS EARNED EACH SEMESTER

Semester 8

STRATEGIC SUPPLY CHAIN ISSUES

Supply Chain Dimensions

- Upstream Supply Chain.
- Operations Management.
- Downstream Supply Chain.
- Supply Chain and Globalization

Supply Chain Forecasting and Planning

- Strategy and strategic planning.
- Supply Chain modelling and optimisation techniques.
- Demand forecasting and S&OP processes.

Digitalization, sustainability and Supply Chain 4.0

- Revolution 4.0 and the Supply Chain.
- Industry 4.0 and its Supply Chain.
- Supply Chain and sustainable development.
- Reverse logistics.

SUPPLY CHAIN DESIGN

Supply chain master plan and network design

- Sourcing and choice of suppliers.
- Setting up production facilities.
- Choice and location of warehouses.
- Distribution and DRP (Distribution Resource Planning).

Supply Chain operation and entities

- Supplier relationship management.
- Customer relationship management.
- Local and international laws governing supply chain activities.
- Outsourcing and management of client/ subcontractor relationships.

Physical flows and international transport

- Modes of transport and international transport.
- International flows and customs operations.
- International trade: Incoterms.

Semester 9

SUPPLY CHAIN MANAGEMENT

Supply Chain coordination and synchronization

- Scheduling and planning Supply Chain activities.
- Organization and optimization of stocks.
- Preventing and controlling operational risks.

Development and management of Supply Chain projects

- Supply Chain Project Team Management.
- Agile methods in Supply Chain project management.
- Lean methods applied to Supply Chain projects.
- Performance indicators and monitoring of Supply Chain projects.

Information systems and Supply Chain performance

- The Supply Chain Information System.
- ERP and APS (Advanced Planning System).
- Supply Chain logistics performance indicators.
- Supply Chain balanced scorecard.

INTERNATIONAL TRANSPORT OPERATIONS

Economics and transport law

- Transport economics.
- Transport law.
- Customs taxation.

International Transport and Import / Export

- Import Operations and Document Chain.
- Export Operations and Document Chain.
- Containerization and palletization.
- Transit and the TIR Convention.

Shipping and port operations

- Maritime law.
- Risk management and maintenance of port facilities.
- Port organization and management.

Network Architecture & Information Systems

Program Objectives

Information systems are now widely open to the outside world: customers, suppliers, distributors. And the data increasingly comes from sources of all kinds, from traditional PCs to mobile devices such as smartphones and tablets as well as everyday objects: smart refrigerators, connected pacemakers, smart grids, etc.

All this is possible only thanks to the power of universal networks, relying on traditional technologies (wired telephone network, radio wave and satellite) and new technologies (mobile technologies, internet).

The objective of the "Integration of Networks and Information Systems" program is to train engineers to be systems integrators with project management skills in areas as diverse as business engineering, systems administration and telecommunications networks. The students acquire an overview and strong skills in working on connected systems, whatever the nature of the data, technology and equipment used. They must also be aware of constantly changing technologies and uses, and their impact on organizations.

Skills Acquired

- Develop specifications for information system communications and the.
- Develop tests to optimize, stabilize and secure the network,
- Implement network equipment and hardware and software solutions guaranteeing quality of service, within the financial limits.
- Develop a technology intelligence system, essential in a rapidly and constantly evolving sector.

Career Opportunities

- Managerial functions:
  Director of Information Systems, Project Manager, IT System Contractor
- Engineering functions:
  Network Architect, Systems Architect, Security Engineer, Consultant, R&D Engineer
- Sales functions: Pre-sales Engineer, Sales Engineer, Key Account Manager

Employment Sectors

From aerospace to energy, no sector can survive today without these technologies!

LA ROCHELLE CAMPUS

180 HOURS

15 ECTS EARNED EACH SEMESTER

Detailed program

Semester 8

Telecommunication Systems

- Introduction to the fundamentals of telecommunications, illustrated with today's main telecommunications systems,
- Communications systems architecture and the necessary equipment.
- Principles of transmission and propagation.

Network Fundamentals

- How different types of networks operate.
- The main protocols and multilayer models.
- Choose the appropriate network topology and deploy a network based on a specification.

Operating Systems

- Fundamentals, advantages and disadvantages of operating systems.
- Overview of file and process management systems.
- Administer an operating system.

Access Networks

- The routers and equipment that connect the subscriber installations to the national telecommunications.
- Connect an ISP to the internet.
- Connection technologies.

IP and Internet Technologies

- Functions, protocols and services associated with Internet networks (IP),
- Set up local area networks (LAN and VLAN).
- Routing protocols and filtering techniques.
- Set up a certification authority and understand the importance of certificates.
- Configure a domain server and related services.

Web Technologies

Part 1

- Prepare for professional certification in the field of networks.
- Deal with the complexity of the techniques related to the WEB.
- Understand the diverse network systems used in enterprises.

Network Archit
& Information S

Semester 9

Information Systems Management

- Manage an Information System Project: audit, planning, team and financial management, IT strategy
- IS project management methods.
- Introduction to ITIL.
- Cloud computing concepts, implementation in a business IT system.
- Business Intelligence (BI) techniques to help decision-makers define the company's strategy.
- Big Data concepts and the difference between Big Data and Business Intelligence.
- Set up IT techniques.

Network Administration and Supervision

- Corporate network environment and the role of a Systems and Network engineer.
- Set up a network security strategy including the effective management of user identities and access rights.
- Develop business continuity plans to minimize the disruption of networks and information systems in case of disaster.

Development for the Internet of Things

- Technologies used by mobile devices.
- Architecture of mobile applications and protocols used.
- Create applications for mobile devices in a dynamic work environment using the appropriate programming language.

Security of Networks and Information Systems

- Defend against threats to an IT system and hacking techniques.
- Prevention techniques such as filtering, access control, certificates and VPNs,
- Design and implement a secure network architecture.

Wireless Networks

- Theoretical operation of wireless networks.
- Deploy a wireless network meeting specifications.
- Wireless network analysis tools and security systems.

Web Technologies

Part 2

- Continue preparing for professional certification in the field of networks.
- Anticipate the emergence of new uses of information and communication technologies.
- Take into account user needs and expectations.

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ECOLE RECONNUE PAR L'ÉTAT

Cti
Commission des Titres d'Ingénieur

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