الجمهورية الجزائرية الديمقراطية الشعبية
People's Democratic Republic of Algeria
وزارة التعليم العالي والبحث العلمي
Ministry of Higher Education and Scientific Research
اللجنة البيداغوجية الوطنية لميدان العلوم و
التكنولوجيا
National Academic Committee for the Sciences and Technology Field

Harmonized Academic Master's Degree

National Program

2025 Update

Field	Specialization	Specialty
Science and Technology	*Industrial Health and Safety*	*Industrial Health and Safety*

I – Master's Program Identification Sheet

Admission Requirements

FIeld	Harmonized Master's Degree	Bachelor's Degrees Granting Access to the Master's Program	Ranking According to the Compatibility of the Bachelor's Degree	Coefficient Assigned to the Bachelor's Degree
Industrial Health and Safety	*Industrial Health and Safety*	*Industrial Health and Safety*	**1**	**1.00**
		Process Engineering	**2**	**0.80**
		Refining and Petrochemicals	**2**	**0.80**
		Other Bachelor's Degrees in the Sciences and Technology Field	**5**	**0.60**

II – Semester-Based Teaching Organization Sheets for the Specialty

Semester 1

Course Unit	Course Title	Credits	Coefficient	Lectures	Directed Work	Practical Work	Semester Contact Hours (15 weeks)	Supplementary Work / Consultation Hours (15 weeks)	Continuous Assessment	Final Exam
Fundamental Course Unit Code: FCU 1.1.1 Credits: 8 Coefficient: 4	Mathematical Tools Used in System Reliability	4	2	1h30	1h30		45h00	55h00	40%	60%
	Numerical and Matrix Methods for Risk Analysis	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental Course Unit Code: FCU 1.1.2 Credits: 10 Coefficient: 5	Risk Measurement and Control	4	2	1h30	1h30		45h00	55h00	40%	60%
	Industrial Physical Hazards	6	3	3h00	1h30		67h30	82h30	40%	60%
Methodological Course Unit (MCU 1.1) Credits: 11 Coefficient: 7	MATLAB Programming	3	2	1h30	1h00		37h30	37h30	40%	60%
	Practical Work: Vibration/Pressure Hazards	2	1			1h30	22h30	27h30	100%	
	Risk Management	2	1	1h30			22h30	27h30		100%
	Practical Work: Lifting and Material Handling	2	1			1h30	22h30	27h30	100%	
	Advanced Python Programming	2	2	1h30		1h30	45h00	55h00	40%	60%
Exploratory Course Unit (ECU 1.1)	Elective Course	1	1	1h30			22h30	2h30		100%

Credits: 1 **Coefficient: 1**										
Total Semester 1		30	1 7	13h30	07h00	04h30	375h00			

Semester 2

Course Units	Course Title	Credits	Coefficient	Weekly Contact Hours			Semester Contact Hours (15 weeks)	Supplementary Work / Consultation Hours (15 weeks) **Lectures**	Assessment Method	
				Lectures	**Directed Work**	**Practical Work**			**Directed Work**	**Practical Work**
Fundamental Course Unit (FCU 1.2.1) **Credits: 8** **Coefficient: 4**	System Reliability 1	4	2	1h30	1h30		45h00	55h00	40%	60%
	Process Safety: Mechanical/Electrical Risks	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental Course Unit (FCU 1.2.2) **Credits: 10** **Coefficient: 5**	Life Cycle Analysis and Eco-Design	6	3	3h00	1h30		67h30	82h30	40%	60%
	Industrial Systems Failure Diagnosis	4	2	1h30	1h30		45h00	55h00	40%	60%
Methodological Course Unit (MCU 1.2) **Credits: 9** **Coefficient: 5**	Computer Software for Industrial Safety	3	2	1h30		1h00	37h30	37h30	40%	60%
	Practical Work: Electrical/Mechanical Hazards	2	1			1h30	22h30	27h30	100%	
	Industrial Feedback and Information Monitoring	2	1	1h30			22h30	27h30		100%
	Human-System Interface Information Systems	2	1	1h30			22h30	27h30		100%
Transversal Course Unit (TCU 1.2) **Credits: 2** **Coefficient: 3**	Compliance with Standards, Ethics, and Integrity	1	1	1h30			22h30	2h30		100%
	Elements of Applied Artificial Intelligence	2	2	1h30		1h30	45h00	5h00	40%	60%
Total – Semester 2		**30**	**17**	**15h00**	**6h00**	**4h00**	**375h00**	**375h00**		

Semester 3

Course Units	Course Title	Credits	Coefficient	Weekly Contact Hours			Semester Contact Hours (15 weeks)	Supplementary Work / Consultation Hours (15 weeks) **Lectures**	Assessment Method	
				Lectures	**Directed Work**	**Practical Work**			Titles	**Examen**
Fundamental Course Unit (FCU 2.1.1) Credits: 8 Coefficient: 4	System Reliability 2	4	2	1h30	1h30		45h00	55h00	40%	60%
	Decision Support Tools	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental Course Unit (FCU 2.1.2) Credits: 10 Coefficient: 5	Functional Safety	4	2	1h30	1h30		45h00	55h00	40%	60%
	Statistical Process Control	6	3	3h00	1h30		67h30	82h30	40%	60%
Methodological Course Unit (MCU 2.1) Credits: 9 Coefficient: 5	Integrated Risk Analysis Methods	3	2	1h30		1h00	37h30	37h30	40%	60%
	Safety Culture	2	1	1h30			22h30	27h30		100%
	Industrial Maintenance	2	1	1h30			22h30	27h30		100%
	Audit, Certification, Accreditation, and Compliance	2	1			1h30	22h30	27h30	100%	
Transversal Course Unit (TCU 2.1) Credits: 1 Coefficient: 1	Literature Research and Thesis Design	1	1	1h30			22h30	2h30	40%	60%
	Reserve engineering	2	2	1h30	1h30 Atelier		45h00	5h00	40%	60%
Total semestre 3		**30**	**17**	**15h00**	**6h00**	**4h00**	**375h00**	**375h00**		

Elective Basket of Exploratory Course Units from Semesters 1, 2, and 3:
1. Ergonomics
2. Safety and Environmental Audit
3. Anatomy and First Aid
4. Crisis Management in Case of Disasters
5. Industrial Pollution: Air, Water, Soil
6. Industrial Toxicology
7. Sensors and Detectors in Industrial Safety
8. Safety Economics
9. Total Reliability
10. Insulating Materials
11. Business Management and Administration
12. Climate Change

Semester 4

Internship in a Company or Research Laboratory, Concluded with a Thesis and Defense

	Weekly Hours	Coeff	Credits
Personal Work	550	09	18
Internship in a Company or Research Laboratory	100	04	06
Seminars	50	02	03
Other (Supervision)	50	02	;03
Total Semester 4	750	17	30

This table is provided for informational purposes only

Evaluation of the Master's Final Project

- Scientific Value (Jury Assessment)   /6
- Thesis Writing (Jury Assessment)   /4
- Presentation and Response to Questions (Jury Assessment)   /4
- Supervisor's Assessment   /3
- Internship Report Presentation (Jury Assessment)   /3

III - Detailed Program by Course for Semester 1

Semester: 1
Course Unit: FCU 1.1.1
Course 1: Mathematical Tools Used in System Reliability
Contact Hours : 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits : 4
Coefficient : 2

Course Objectives:

Basic concepts and notions used in probability calculations; application of probabilities to the evaluation of system reliability of an entity.

Recommended Prior Knowledge: Basic Mathematical Concepts.

Course Content:

- **Chapter 1:** Context and Nature of Studies (3 weeks)
- **Chapter 2:** Review of Probability and Random Variables (3 weeks)
- **Chapter 3:** Main Probability Laws (3 weeks)
- **Chapter 4:** Selected Definitions in System Reliability (3 weeks)
- **Chapter 5:** Feedback from Experience / Case Studies (3 weeks)

Assessment Method:

- Final Exam: 60%
- Continuous Assessment: 40%

Semester : 1
Course Unit: FCU 1.1.1
Course 2: Numerical and Matrix Methods for Risk Analysis
Contact Hours : 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits : 4
Coefficient : 2

Course Objectives:

The purpose of this module is to present several basic numerical methods used for solving linear systems, nonlinear equations, ordinary and partial differential equations, for the numerical computation of integrals, and for function approximation using polynomial interpolation. The module also introduces students to theoretical analysis techniques for these methods. Some practical aspects of implementation are covered, and the use of these methods is motivated by "real-world" problems. The presentation and analysis of the methods are complemented by student implementation and application exercises using **MATLAB** and **SCILAB**

Recommended Prior Knowledge: Mathematics and Computer Science

Course Content:

- **Chapter 1:** Generalities on Numerical Analysis and Scientific Computing (3 weeks)
- **Chapter 2:** Numerical Linear Algebra – Direct Methods for Solving Linear Systems (3 weeks)
- **Chapter 3:** Iterative Methods for Solving Linear Systems (3 weeks)
- **Chapter 4:** Computation of Eigenvalues and Eigenvectors (3 weeks)
- **Chapter 5:** Numerical Treatment of Functions (3 weeks)

Assessment Method:
- **Continuous Assessment: 40%**
- **Final Exam: 60%**

Semester: 1
Course Unit: FCU 1.1.2
Course 1: Risk Measurement and Control
Contact Hours (VHS): 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Objectives:
- To examine how to define a target objective for the probability of failure of a Risk Control Measure (RCM).
- To address methods for evaluating the probabilities of failure of active and passive safety devices (safety valves, containment basins, etc.).
- To present the main methodologies used to evaluate the probabilities of failure of Risk Control Measures involving human intervention (organizational measures and manually operated safety systems).

Recommended Prior Knowledge:
Concepts used in calculations and application of the main probability laws.
Course Content:

- **Chapter 1:** Elements of Risk Control (General Principles and Definitions) and Basic Steps of Risk Control (3 weeks)
- **Chapter 2:** Different Types of Risk Control Measures (RCMs) (3 weeks)
- **Chapter 3:** Methods for Evaluating the Probability of Failure of a Risk Control Measure (3 weeks)
- **Chapter 4:** Methods for Evaluating the Probability of Failure of Safety Devices (3 weeks)
- **Chapter 5:** Methods for Evaluating the Probability of Failure of Human-Involved Risk Control Measures (3 weeks)

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

Semester: 1
Course Unit: FCU 1.1.2
Course 2: Industrial Physical Hazards
Contact Hours: 67 h 30 (Lecture: 3 h 00, Tutorial: 1 h 30)
Credits: 6
Coefficient: 3

Course Objectives:
- To understand the phenomena of electrical leakage, the associated risks, and appropriate preventive measures.
- To understand the causes of this type of risk.
- To understand vibration phenomena affecting humans and industrial structures, as well as the resulting risks.
- To examine risks related to pressure systems (gas cylinders, hydraulic and pneumatic pressure, etc.).

Course Content:
Part A: Vibration and Pressure Hazards (7 weeks)
- Chapter 1: Concepts of Vibrations and Pressure – Characteristics
- Chapter 2: Standards and Regulations
- Chapter 3: Impact of Vibrations on Humans and Machinery
- Chapter 4: Impact of Pressure
- Chapter 5: Safety of Personnel and Installations
Part B: Lifting and Material Handling Hazards (8 weeks)
- Chapter 1: Introduction
- Chapter 2: Description of Lifting and Material Handling Equipment
- Chapter 3: Inspection of Lifting and Material Handling Equipment
- Chapter 4: Safe Operating Rules for Lifting and Handling Equipment
- Chapter 5: Maneuvers, Risk Identification, and Safety Rules Related to Lifting and Handling Operations
Assessment Method:
- Continuous Assessment: 40%
- Final Exam: 60%

Semester: 1
Course Unit: CU 1.1
Course 1: MATLAB Programming
Contact Hours: 37 h 30 (Lecture: 1 h 30, Tutorial: 1 h 00)
Credits: 3
Coefficient: 2

- **Course Objectives:**
  Mastery of programming using MATLAB/Simulink.
- **Recommended Prior Knowledge:**
  Basic principles of computer programming, algorithms, and structured programming languages (Fortran, C)**.**

Course Content:
Chapter 1 (3 weeks)
  1. Study of the MATLAB environment (latest version), contextual help, and MATLAB data types.
  2. Vectors: creation, concatenation, vector operations; polynomial operations; matrices and predefined arrays.
Chapter 2 (3 weeks)
  1. MATLAB functions and the structure of a function body.
  2. Command and function files (M-files): script files and function files.
Chapter 3 (3 weeks)
  1. Input/Output functions and commands.
  2. Graphics: 2D plotting, Cartesian and polar coordinates.
Chapter 4 (3 weeks)
  1. Function programming in MATLAB.
  2. Solving a single-variable equation.
  3. Finding the minimum or maximum of a function.
Chapter 5 (2 weeks)
  1. Linear and nonlinear interpolation.
  2. Least-squares interpolation.
  3. Optimization.
Chapter 6 (1 week)
  1. Numerical integration.
  2. Ordinary differential equations.

Assessment Method:
- Continuous Assessment: 40%
- Final Exam: 60%

Semester: 1
Course Unit: MCU 1.1
Course 2: Practical Work: Vibration and Pressure Hazards
Contact Hours: 22 h 30 (Practical Work: 1 h 30)
Credits: 2

Course Objectives:
To understand vibration phenomena affecting humans and industrial structures, as well as the associated risks.
To examine risks related to pressure systems (gas cylinders, hydraulic and pneumatic pressure, etc.).

Recommended Prior Knowledge:
Physics (Semesters 1 and 3)

Course Content:
- **Practical Session 1:** Characteristics of Vibrations and Relevant Standards
- **Practical Session 2:** Measurement of Vibrations and Their Impact on Humans and Machinery
- **Practical Session 3:** Pressure Measurement and Diagram Reading (Symbols)
- **Practical Session 4:** Protection Measures Against Overpressure
- **Practical Session 5:** Study of a Pressure Installation (Hydraulic/Pneumatic)

Assessment Method:
- Continuous Assessment: 100%

Semester: 1
Teaching Unit: UEM 1.1
Course Title: Risk Management
Total Hours (VHS): 22h30 (Lectures: 1h30)
Credits: 2
Coefficient:

Course Content:

- From Risk Handling to Risk Management (ISO 31000)

- Key Aspects of Risk Communication and Public Information

- Case Studies on Project Risks

Assessment Method:

- Final Exam: 100%

Semester: 1
Course Unit: UEM 1.1
Course 4: Practical Work: Lifting and Material Handling Hazards
Contact Hours: 22 h 30 (Practical Work: 1 h 30)
Credits: 2
Coefficient:

- **Course Objectives:**

  Study the characteristics of an overhead crane and learn lifting and material handling operations, as well as the associated risks.

- **Recommended Prior Knowledge:**

  Physics (Semesters 1 and 3)

- **Course Content:**

- **Practical Session 1:** Study of the characteristics of the overhead crane

- **Practical Session 2:** Determination of the sling angle

- **Practical Session 3:** Study of load sway and anti-sway techniques

Assessment Method:

  Continuous Assessment: 100%

Course Unit: UEM 1.1
Course 4: Advanced Python Programming
Contact Hours: 22 h 30 (Lecture: 1 h 30; Practical Work: 1 h 30)
Credits: 2
Coefficient:

Course Objectives:
- Deepen mastery of the Python language and introduce students to the basics of data analysis and artificial intelligence.
- Acquire a solid foundation in computer science.
- Learn programming in Python and Excel.
- Master task automation.
- Master a project management software.

Prerequisites:
Python Programming

Course Content:
- **Chapter 1:** Review of Python Programming (2 weeks)
- **Chapter 2:** Programming and Automation (4 weeks)
- **Chapter 3:** Advanced Excel Learning (2 weeks)
- **Chapter 4:** Introduction to GanttProject (2 weeks)
- **Chapter 5:** Advanced Object-Oriented Programming (3 weeks)
- **Chapter 6:** Introduction to Data for Artificial Intelligence (2 weeks)

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

IV - Detailed Program by Course for Semester 2

Course Unit: FCU 1.2.1
Course 1: System Reliability 1
Contact Hours: 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Content:

- Introduction to System Reliability: Definition, historical overview, importance, and challenges of system reliability

- Foundations of System Reliability:
  - Constraints, attributes, and methods
  - Inductive and deductive approaches to system reliability
  - Study sequence of system reliability
  - Objectives of system reliability and allocation of objectives
  - System reliability data

- Qualitative Study of System Reliability:
  - Functional analysis of systems using methods such as DBF, SADT, AF, etc.
  - Dysfunctional analysis of systems using methods such as APR, FMEA, HAZOP

Assessment Method:

- Continuous Assessment: 40%
- Final Exam: 60%

Semester: 2
Course Unit: FCU 1.2.1
Course 2: Process Safety: Mechanical/Electrical Risks
Contact Hours: 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Content:
- **Chapter 1:** Effects of leakage currents on humans; electrical hazards.
- **Chapter 2:** Different leakage regimes; capacitive leakage; resistive leakage.
- **Chapter 3:** Detecting and assessing hazards in electrical installations and equipment; implementing protection for personnel and equipment against electric shocks.
- **Chapter 4:** Detection and assessment of mechanical hazards in installations involving manual handling, mechanized handling, and lifting operations with risks.
- **Chapter 5:** Hydraulic and pneumatic installations under pressure; work in confined spaces, enclosed areas, or at heights.

Assessment Method:
- Continuous Assessment: 40%
- Final Exam: 60%

Semester: 2
Course Unit: FCU 1.2.2
Course 1: Life Cycle Analysis and Eco-Design
Contact Hours: 67 h 30 (Lecture: 3 h 00, Tutorial: 1 h 30)
Credits: 6
Coefficient: 3

Course Content:
- Concepts and Terminology
- Methodology
- LCI vs LCA (Life Cycle Inventory vs Life Cycle Assessment)
- Life Cycle Impacts
- Importance of Eco-Design
- Eco-Design Methods

Assessment Method:
- Continuous Assessment: 40%
- Final Exam: 60%

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Semester: 2
Course Unit: FCU 1.2.2
Course 2: Industrial Systems Failure Diagnosis
Contact Hours: 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Content:
- Concepts and Terminology of Failure Diagnosis
- Diagnostic Methods
- Decision-Making and Diagnosis

Assessment Method:
- Continuous Assessment: 40%
- Final Exam: 60%

Semester: 2
Course Unit: UEM 1.2
Course 1: Software Tools for Industrial Safety
Contact Hours: 37 h 30 (Lecture: 1 h 30, Practical Work: 1 h 00)
Credits: 3
Coefficient: 2

Course Content:
- *Software for Workplace Study (e.g., CAPTIV)*
- *Software for Risk Perception (e.g., SPSS, R+)*
- *Software for System Reliability (e.g., LAAS, MocaRP, etc.)*
- *Software for Risk Analysis (e.g., GIS, Fluent, ALLOHA, PHAST, etc.)*

Assessment Method:
- *Continuous Assessment: 40%*
- *Final Exam: 60%*

Semester: 2
Course Unit: UEM 1.2
Course 2: Practical Work: Electrical/Mechanical Hazards
Contact Hours: 22 h 30 (Practical Work: 1 h 30)
Credits: 2
Coefficient: 1

Course Objectives:
Learn the methodology for monitoring the insulation condition of electrical networks and evaluating their insulation level relative to the ground, taking into account capacitive and resistive components.

Recommended Prior Knowledge:
Experience using an insulation tester and an ohmmeter for grounding measurement.

Course Content:
- Physical simulation of a three-phase electrical network on a test bench
- Detection of leakage current
- Evaluation of the insulation condition of an electrical network

Assessment Method:
- Continuous Assessment: 100%

Semester: 2
Course Unit: UEM 1.2
Course 3: Industrial Feedback and Information Monitoring
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 2
Coefficient: 1

Course Content:
- Overview of Industrial Feedback: definition, origins, and procedural management
- Fields of Application (reliability data, identification of precursors, etc.)
- Knowledge Management and Methods for Knowledge Capitalization in Industrial Safety
- Utilization of Industrial Feedback through Case Analysis
- Data Mining
- Bayesian Approach
- Types and Indicators of Information Monitoring
- Information Monitoring Processes

Assessment Method:
- Final Exam: 100%

Semester: 2
Course Unit: UEM 1.2
Course 4: Information Systems in HSI (Human-System Interaction)
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 2
Coefficient: 1

Course Content:
1. Definition and Basic Concepts of Industrial Information Systems (IIS)
2. Architecture of IIS
3. IIS Security
4. Software Related to IIS

Assessment Method:
- Final Exam: 100%

Semester: 2
Course Unit: UET 1.2
Course: Compliance with Standards, Ethics, and Integrity Rules
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 1
Coefficient: 1

Course Objectives:
Develop students' awareness of ethical principles and rules governing university life and the professional world.
Raise awareness of respecting and valuing intellectual property.
Explain the risks of moral misconduct, such as corruption, and ways to combat them.
Alert students to the ethical challenges posed by new technologies and sustainable development.

Recommended Prior Knowledge:
Ethics and Professional Conduct (Foundations**)**

Course Content:
A. Respect for Ethics and Integrity Rules
B. Intellectual Property
C. Ethics, Sustainable Development, and New Technologies

Assessment Method: Final Exam: 100%

Semester: 2
Course Unit: UET 1.2
Course 2: Fundamentals of Applied Artificial Intelligence
Contact Hours: 45 h (Lecture: 1 h 30, Practical Work: 1 h 30)
Credits: 2
Coefficient: 2

Course Objectives:
- Master AI algorithms
- Introduction to the fundamental concepts, tools, and applications of modern artificial intelligence, with emphasis on practical use of Python and its libraries
- Deepen Python programming skills
- Understand AI approaches for problem-solving

Course Content:
- Chapter 1: Introduction to Artificial Intelligence (AI) (1 week)
- Chapter 2: Basic Mathematics for AI (1 week)
- Chapter 3: Machine Learning (3 weeks)
- Chapter 4: Supervised Classification (3 weeks)
- Chapter 5: Unsupervised Learning
- Chapter 6: Neural Networks
- Chapter 7: Mini Project (supervised personal work outside class)

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

V - Detailed Program by Course for Semester 3

Semester: 3
Course Unit: FCU 2.1.1
Course 1: System Reliability 2
Contact Hours: 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Content:

- Quantitative Study of System Reliability

- Dysfunctional Analysis of Systems Using Static Methods

- Combinatorial Analysis of Systems Using Static Methods

- Combinatorial Analysis of Systems Using Dynamic Methods: Markov Chains (homogeneous and non-homogeneous) and Petri Nets (discrete and continuous)

Assessment Method:

- Final Exam: 60%

- Continuous Assessment: 40%

Semester: 3
Course Unit: FCU 2.1.1
Course 2: Decision Support Tools
Contact Hours: 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Content:
- Introduction to Decision Support: definition, stakes, and challenges
- Decision-Making Processes
- Decision Support Methods: qualitative and quantitative approaches
- Case Studies: Decision-Making in Projects
- Case Studies: Agile Decision-Making

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

Semester: 3
Course Unit: FCU 2.1.2
Course 1: Functional Safety
Contact Hours: 45 h (Lecture: 1 h 30, Tutorial: 1 h 30)
Credits: 4
Coefficient: 2

Course Content:
- Fundamentals of Functional Safety of Systems
- Standards Dedicated to Functional Safety
- Standards Specific to Machine Safety
- Generic Standards for Intelligent Safety Systems (Safety Instrumented Systems)

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

Semester: 3
Course Unit: FCU 2.1.2
Course 2: Statistical Process Control
Contact Hours: 67 h 30 (Lecture: 3 h 00, Tutorial: 1 h 30)
Credits: 6
Coefficient: 3

Course Content:
- Definition and Fundamentals of Statistical Process Control (FSP)
- FSP Fundamentals: Monitoring and Managing Processes Using Control Charts and Capability Evaluation
- FSP Methods
- Industrial Case Studies

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

Semester: 3
Course Unit: UEM 2.1
Course 1: Integrated Risk Analysis Methods
Contact Hours: 37 h 30 (Lecture: 1 h 30, Practical Work: 1 h 00)
Credits: 3
Coefficient: 2

Course Content:
- Limitations of Classical Risk Analysis Methods (FMEA, FTA, etc.)
- Complementarity between Classical Risk Analysis Methods
- Advantages of Integrated Risk Analysis Methods (possibility of combining classical methods into a single integrated approach)
- MADS-MOSAR Method
- ARAMIS Method
- LOPA Method
- BORA Method
- Quantitative Risk Assessment (QRA)

Assessment Method:
- Final Exam: 60%
- Continuous Assessment: 40%

Semester: 3
Course Unit: UEM 2.1
Course 2: Safety Culture
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 2
Coefficient: 1

Course Content:
- Industrial Safety Competencies
- Organizational Culture vs. Safety Culture
- Fundamentals of Safety Culture (regulated vs. managed safety, top-down and bottom-up stakeholder engagement)
- Human Behavior in the Workplace (evaluation focused on adherence to work procedures, with supporting tools such as PostCard)

Assessment Method:
- Final Exam: 100%

Semester: 3
Course Unit: UEM 2.1
Course 3: Industrial Maintenance
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 2
Coefficient: 1

Course Content:
- Definition and Types of Maintenance
- Maintenance Functions and Services
- Importance of Maintenance (Maintenance and Safety, Maintenance and Quality, Maintenance and Environment)
- Maintenance Methods (Technical and Organizational Approaches)
- Maintenance Management: Case of Outsourcing (Subcontracting)

Assessment Method:
- Final Exam: 100%

Semester: 3
Course Unit: UEM 2.1
Course 4: Audit, Certification, Accreditation, and Compliance
Contact Hours: 22 h 30 (Practical Work: 1 h 30)
Credits: 2
Coefficient: 1

Course Content:
- Common Aspects of Audit, Certification, Accreditation, and Compliance
- Appropriate Procedures and Approaches

Assessment Method:
- Continuous Assessment: 100%

Semester: 3
Course Unit: UET 2.1
Course 1: Literature Review and Thesis Design
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 1
Coefficient: 1

Course Objectives:

Provide students with the necessary tools to search for and effectively exploit relevant information for their final-year project. Guide them through the stages leading to the writing of a scientific document. Highlight the importance of communication and teach them to present their work rigorously and pedagogically.

Recommended Prerequisites:

Writing Methodology, Presentation Methodology

Course Content:

Part I – Literature Review:

- Chapter I-1: Defining the Topic (2 weeks)
- Chapter I-2: Selecting Information Sources (2 weeks)
- Chapter I-3: Locating Documents (1 week)
- Chapter I-4: Processing Information (2 weeks)
- Chapter I-5: Bibliography Presentation (1 week)

Part II – Thesis Design:

- Chapter II-1: Thesis Plan and Stages (2 weeks)
- Chapter II-2: Writing Techniques and Standards (2 weeks)
- Chapter II-3: Workshop: Critical Review of a Manuscript (1 week)
- Chapter II-4: Oral Presentations and Defenses (1 week)
- Chapter II-5: How to Avoid Plagiarism (1 week)

Assessment Method:

- Final Exam: 100%

Semester: 3
Course Unit: UET 2.1
Course 1: Reverse Engineering
Contact Hours: 45 h 00 (Lecture: 1 h 30, Workshop: 1 h 30)
Credits: 2
Coefficient: 2

Course Objectives:
- Understand the principles and objectives of Reverse Engineering (RE) in the field of Science and Technology (ST).
- Gain familiarity with the tools and methods of RE within the relevant specialty.
- Comprehend the value and ethics of RE principles in product design, manufacturing, and quality assurance.
- Foster critical thinking, technical curiosity, reasoned reverse engineering, and innovation.
- Learn to analyze, document, and model an existing system without initial documentation.

Prerequisites:
- Fundamental knowledge in the relevant specialty.

Course Content:
1. Introduction to Reverse Engineering
2. General Methodology
3. Hardware Reverse Engineering
4. Software Reverse Engineering
5. Mechanical Reverse Engineering
6. Security and Intrusion Detection
7. Real Case Studies

Assessment Method:
- Continuous Assessment / Exam (to be specified by the instructor)

Programmes de quelques matières découvertes

Course: Major Risks
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 1
Coefficient: 1

Course Objectives:

Learn to manage major-risk situations effectively.

Recommended Prerequisites:

Risk analysis methods, crisis management

Course Content:

- Chapter 1: Major Accidents or Disasters (3 weeks)
- Chapter 2: Major Industrial Risks and Accidents (3 weeks)
- Chapter 3: Fires and Explosions (3 weeks)
- Chapter 4: Toxic and Ecotoxic Substances (3 weeks)
- Chapter 5: Legislation, Regulation, Standardization, and Organization; Prevention Before the Accident; Response After the Accident (3 weeks)

Assessment Method:

- Final Exam: 100%

Course: Fire Risk Prevention and Detection
Contact Hours: 22 h 30 (Lecture: 1 h 30)
Credits: 1
Coefficient: 1

Recommended Prerequisites:
Fire risks in industrial or organizational settings

Course Content:

- **Chapter 1:** Fire Prevention – Basic General Knowledge (3 weeks)
- **Chapter 2:** Fire Behavior (3 weeks)
- **Chapter 3:** Building Design – Fire Isolation and Structural Stability (3 weeks)
- **Chapter 4:** Compartmentalization – Principles and Objectives, Smoke Extraction (3 weeks)
- **Chapter 5:** Fire Detection, Rescue Equipment, and Emergency Interventions (3 weeks)

Assessment Method:

- Continuous Assessment: 40%
- Final Exam: 60%