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Democratic and Popular Republic of Algeria
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Ministry of Higher Education and Scientific Research
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National Educational Committee for the Science and Technology sector

ACADEMIC MASTER HARMONIZE

National Program

Updated 2022

Domain	Sector	Speciality
Sciences And Technologies	***Industrial hygiene and safety***	***Industrial hygiene and safety***

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National Educational Committee for the Science and Technology sector

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Updated 2022

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I – Master’s identity card

Access conditions

Sector	Harmonized Master	Licenses providing access at the master's level	Ranking by license compatibility	Coefficient assigned to the license
Industrial hygiene and safety	Industrial hygiene and safety	Industrial hygiene and safety	**1**	**1.00**
		Process engineering	**2**	**0.80**
		Refining and petrochemicals	**2**	**0.80**
		Other licenses in the ST domain	**5**	**0.60**

II – Half-yearly organization sheets for the specialty courses

Semester 1

Unit teaching	Materials Titled			Hourly volume weekly Tutorial course		TP	Volume Half-yearly schedule (15 weeks)	Work Complementary in consultation (15 weeks)	Assessment method Control Continuous	Exam
Fundamental EU Code: UEF 1.1.1 Credits: 8 Coefficients: 4	Mathematical tools used in Operational Safety	4	2	1h30	1h30		45h00	55h00	40%	60%
	Numerical Methods and Matrix Analysis of the Risk	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental EU Code: UEF 1.1.2 Credits: 10 Coefficients: 5	Measurement and control of risk	4	2	1h30	1h30		45h00	55h00	40%	60%
	Industrial physical risks	6	3	3h00	1h30		67h30	82h30	40%	60%
EU Methodological Code: UEM 1.1 Credits: 9 Coefficients: 5	MATLAB Programming	3	2	1h30	1 hour		37h30	37h30	40%	60%
	TP Dangers of vibrations/pressures	2	1			1h30	10:30 p.m.	27:30	100%	
	Risk management	2	1	1h30			10:30 p.m.	27:30		100%
	TP Lifting and handling	2	1			1h30	10:30 p.m.	27:30	100%	
EU Discovery Code: UED 1.1 Credits: 2 Coefficients: 2	Choice of material	1	1	1h30			10:30 p.m.	2h30		100%
	Choice of material	1	1	1h30			10:30 p.m.	2h30		100%
Transversal EU Code: UET 1.1 Credits: 1 coef.1	Technical English and Terminology	1	1	1h30			10:30 p.m.	2h30		100%
Total semester 1		**30**	**17**	**3:00 p.m.**	**7:00 a.m.**	**3:00 a.m.**	**375 hours**	**375 hours**		

Semester 2

Unit teaching	Materials Titled			Hourly volume weekly Tutorial course		TP	Volume Hourly Biannual (15 weeks)	Work Complementary in consultation (15 weeks)	Assessment method Control Continuous	Exam
Fundamental EU Code: UEF 1.2.1 Credits: 8 Coefficients: 4	Safety of operation of systems 1	4	2	1h30	1h30		45h00	55h00	40%	60%
	Process safety: mechanical/electrical risks	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental EU Code: UEF 1.2.2 Credits: 10 Coefficients: 5	Life cycle analysis and eco-design	6	3	3:00 a.m. to 1:30 a.m.			67h30	82h30	40%	60%
	Diagnostics of industrial systems failures	4	2	1h30	1h30		45h00	55h00	40%	60%
Methodological EU Code: UEM 1.2 Credits: 9 Coefficients: 5	Computer software dedicated to industrial security	3	2	1h30		1 hour	37h30	37h30	40%	60%
	TP Dangers Electrical/Mechanical	2	1			1h30	10:30 p.m.	27:30	100%	
	Industrial feedback and information monitoring	2	1	1h30			10:30 p.m.	27:30		100%
	HSI Information System	2	1	1h30			10:30 p.m.	27:30		100%
EU Discovery Code: UED 1.2 Credits: 2 Coefficients: 2	Subject of your choice	1	1	1h30			10:30 p.m.	2h30		100%
	Subject of your choice	1	1	1h30			10:30 p.m.	2h30		100%
Transversal EU Code: UET 1.2 Credits: 1 Coefficients: 1	Compliance with standards and rules of ethics and integrity	1	1	1h30			10:30 p.m.	2h30		100%
Total semester 2		**30 17**		**4:30 p.m.**	**6:00 a.m.**	**2:30 a.m.**	**375 hours**	**240 hours**		

Semester 3

Unit teaching	Materials Titled			Hourly volume weekly Tutorial course		TP	Volume Half-yearly schedule (15 weeks)	Work Complementary in consultation (15 weeks)	Assessment method Control Continuous	Exam
Fundamental EU Code: UEF 2.1.1 Credits: 8 Coefficients: 4	Safety of operation of systems 2	4	2	1h30 1h30			45h00	55h00	40%	60%
	Decision support tools	4	2	1h30 1h30			45h00	55h00	40%	60%
Fundamental EU Code: UEF 2.1.2 Credits: 10 Coefficients: 5	Functional safety	4	2	1h30 1h30			45h00	55h00	40%	60%
	Statistical mastery of process	6	3	3:00 a.m. to 1:30 a.m.			67h30	82h30	40%	60%
Methodological EU Code: UEM 2.1 Credits: 9 Coefficients: 5	Integrated risk analysis methods	3	2	1h30		1 hour	37h30	37h30	40%	60%
	Safety culture	2	1	1h30			10:30 p.m.	27:30		100%
	Industrial maintenance	2	1	1h30			10:30 p.m.	27:30		100%
	Audit, Certification, Accreditation and Implementation compliance	2	1			1h30	10:30 p.m.	27:30	100%	
EU Discovery Code: UED 2.1 Credits: 2, Coef.: 2	Subject of your choice	1	1	1h30			10:30 p.m.	2h30	40%	60%
	Subject of your choice	1	1	1h30			10:30 p.m.	2h30	40%	60%
Transversal EU Code: UET 2.1 Credits: 1, Coef.: 1	Documentary research and memory design	1	1	1h30			10:30 p.m.	2h30	40%	60%
Total semester 3		**30 17**	**4:30 p**	**m. 6:00 a.m.**	**2:30 a.m.**		**375 hours**	**375 hours**		

Subjects that may appear in the Discovery units:

1) Security economics
2) Total reliability
3) Industrial pollution of air, water, soil
4) Environmental protection and sustainable development
5) Industrial poisoning
6) Sensors and detectors
7) Insulating materials
8) Energy storage
9) Renewable energies
10) Biomass and biofuels
11) Technical and economic evaluation of processes
12) Environmental management
13) Chemical and Biochemical Sensors
14) Bio-batteries
15) Green chemistry – Clean processes
16) Corrosion and protection of equipment
17) Business management and administration
18) Technical and economic evaluation of the processes
19) Climate change
20) Simulation and Optimization of Processes
21) Microbiology and Environmental Biochemistry
22) Process regulation and control

NB: Other subjects may be chosen with the prior agreement of the CPND-ST

III - Detailed program by subject for semester S1

Semester: 1

Teaching unit: UEF 1.1.1
Subject 1: Mathematical tools used in operational safety
VHS: 45h00, Course: 1h30, Tutorial: 1h30
Credits: 4
Coefficient: 2

Teaching objectives:

Basic concepts, Notions used in probability calculations, Application of probabilities in the evaluation of the SdF of an entity.

Recommended prior knowledge : Basic Mathematical Notions.

Content of the subject :

Chapter 1. Context and Nature of Studies **(3 Weeks)**
Chapter 2. Reminders of Probabilities and Random Variables **(3 Weeks)**

Chapter 3. Main Laws of Probability **(3 weeks)**

Chapter 4. Some Definitions of Operational Safety **(3 Weeks)**

Chapter 5. Feedback **(3 weeks)**

Assessment method: Exam: 60%, Continuous Assessment: 40%

Bibliographic references:

1. PAGES A., GONDRAN M., "Reliability of systems", Collection of the Directorate of Studies and Research of Electricity of France No. 39, Eyrolles, 1980.

2. VILLEMEUR A., "Operational safety of industrial systems", Collection of the Directorate of Studies and Research of Electricity of France No. 67, Eyrolles, 1988.

3. AUPIED J., "Feedback applied to the operational safety of equipment industrialists", Collection of the Directorate of Studies and Research of Electricity of France No. 87, Eyrolles, 1994.

Semester: 1

Teaching unit: UEF 1.1.1

Subject 2: Numerical and Matrix Methods of Risk Analysis

VHS: 45h00, Course: 1h30, Tutorial: 1h30,

Credits: 4

Coefficient: 2

Teaching objectives

The aim of this module is to present several basic numerical methods used for solving linear systems, nonlinear equations, differential and partial differential equations, for the numerical calculation of integrals or for the approximation of functions by polynomial interpolation, as well as to introduce students to the techniques of (theoretical) analysis of these latter. Some practical aspects of implementation are also mentioned and the use of the methods is motivated by "concrete" problems. The presentation and analysis of the methods are supplemented by implementation and application work.

produced by students using MATLAB and SCILAB software.

Recommended prior knowledge : Mathematics and Computer Science

Content of the material

Chapter 1. General information on numerical analysis and scientific calculation (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. Calculation of eigenvalues and eigenvectors **(3 weeks)**

Chapter 5. Numerical processing of functions **(3 weeks)**

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references

1. *L. AMODEI and J.-P. DEDIEU. Numerical matrix analysis. Mathematics for the master/ SMAI. Dunod, 2008.*
2. *G. ALLAIRE and SM KABER. Numerical Linear Algebra. Second Cycle Mathematics. Ellipses, 2002.*
3. *PG CIARLET. Introduction to Numerical Matrix Analysis and Optimization – Course and Corrected Exercises. Applied Mathematics for Master's Degree. Dunod, 1998.*

Semester: 1

Teaching unit: UEF 1.1.2

Subject 1: Risk Measurement and Control

VHS: 45h00, Course: 1h30, Tutorial: 1h30

Credits: 4

Coefficient: 2

Teaching objectives:

- See how it is possible to define an objective on the probability of failure of an MMR.

- See how to approach the methods for assessing the probabilities of failure of active and passive safety devices (valve, retention bowl, etc.).
- The main methodologies for assessing the probabilities of MMRs involving humans (organizational measurement and manual safety action system).

Recommended prior knowledge :

Concepts used in calculations and application of the Main Laws of Probability.

Content of the subject :

Chapter 1. Elements of risk control (General principles and definitions) andBasic steps of risk management **(3 weeks)**

Chapter 2. Different types of Risk Control Measures (MMR) **(3 Weeks)**

Chapter 3. Methods for assessing the probability of failure of an **MMR (3 weeks)**

Chapter 4. Methods for assessing the probability of failure of safety devices **(3 weeks)**

Chapter 5. Methods for assessing the probability of failure of Measures Risk Management involving humans **(3 weeks)**

Assessment method: Exam : 60%, Continuous Assessment: 40%

Bibliographic references:

1. MORTUREUX (Y.). – Operational safety: methods for controlling risks. Engineering Techniques [AG 4 670], 2001.

2. VEROT (Y.). – General approach to risk control in process industries. Engineering Techniques [AG 4 605], 2001.

3. MICHE (E.), PRATS (F.) and CHAUMETTE (S.) – Omega 20: Approach to evaluating Human Barriers. INERIS Report, Dec. 2006.

4. Institute for Risk Management (IMdR) http:// www.imdr-sdf.asso.fr

5. Institute for an Industrial Risk Culture . http:// www.icsi-eu.org/

Semester: 1

Teaching unit: UEF 1.1.2

Subject 2: Industrial Physical Risks VHS: 67h30,

Lecture: 3h00, Tutorial: 1h30, Credits: 6

Coefficient: 3

Teaching objectives:

Understand the phenomena of electrical leaks, the risks that result from them and appropriate prevention.

Understanding what causes this type of risk.

Understanding the effects of vibration on humans, industrial structures and the risks that result from them. Risks due to pressure (gas cylinders, hydraulic/pneumatic pressure, etc.)

Recommended prior knowledge :

Physics of S1 & S3

Content of the subject:

Part A: Vibration/Pressure Hazards (7 Weeks)

Chapter 1. Concepts of vibrations, pressures, characteristics

Chapter 2. Standards, regulations

Chapter 3. Impact of vibrations on man/machines

Chapter 4. Impact of pressure

Chapter 5. Safety of personnel / Facilities

Part B: Hazards Lifting and handling Chapter 1. **(8 Weeks)**

Introduction Chapter 2.

Description of lifting and handling equipment Chapter 3. Inspection of lifting and handling equipment

Chapter 4. Rules for the safe operation of lifting and handling equipment

Chapter 5. Maneuvers and Identification of risks and safety rules related to lifting and handling operations

Assessment method: Continuous assessment: 40%; Exam: 60%.

Bibliographic references:

- ***LACORE. JP*** *Machines, robots, complex installations and security. MASSON.*

- ***CHOQUET.*** *R. Electrical safety. Prevention techniques. DUNOD.*

- ***FOLLIOT.*** *D. Accidents of electrical origin and their prevention. MASSON.*

- ***BERTHOZ.*** *Effects of vibrations on humans. In SCHERER, Outline of Physiology of Work, MASSON.*

- ***INRS.*** *Industrial vibrations. ED.*

- ***JAYAT, ROURE and BITSCH.*** *Angio-neurotic disorders caused by vibrations of hammer drills. MASSON.*

-***International Organization for Standardization.*** *ISO 11228-1 International Standard, Ergonomics – Manual handling – Part 1: Vertical and horizontal handling, 1st ed., Geneva, 2003.*

Semester: 1

Teaching unit: UEM1.1
Subject 1: MATLAB Programming
VHS: 37h30, Course: 1h30, Tutorial: 1h00
Credits: 3
Coefficient: 2

Teaching objectives:
Proficiency in programming under Matlab/Simulink

Recommended prior knowledge : Basic principles of computer programming, algorithms and programming in structured languages (Fortran C)

Content of the material

Chapter 1. (3 Weeks)
1. Study of the MATLAB environment in its new version, Contextual help, MATLAB data types.

2. Vectors: creation, concatenation, operations on vectors, operations on polynomials. Predefined matrices and tables.

Chapter 2. (3 Weeks)
1. MATLAB functions, Study of the structure of the body of a function 2. Command and function files (M files), Script files, Function files.

Chapter 3. (3 Weeks)
1. Inputs/outputs, Input/output functions and controls.
2. Graphics, 2D Graphics, Cartesian and Polar Coordinates.

Chapter 4. (3 weeks)
1. Programming functions in MATLAB.
2. Solving an equation with one variable.
3. Finding a minimum or maximum of a function.

Chapter 5. (2 weeks)
1. Linear and non-linear interpolation.
2. Least squares interpolation.
3. Optimization.

Chapter 6. (1 week)
1. Numerical integration.
2. Ordinary differential equations.

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references

1. *Matlab for Engineers, Adrian Biran*
2. *An Engineering Guide to MATLAB, EB Magrab et.al. Prentice Hall , 2000*

Semester: 1

Teaching unit: UEM1.1

Subject 2: Practical work on Vibration/Pressure Hazards

VHS: 10:30 p.m., TP: 1:30 p.m.

Credits: 2

Coefficient: 1

Teaching objectives:

Understanding the effects of vibration on humans, industrial structures and the risks that result from them. Risks due to pressure (gas cylinders, hydraulic/pneumatic pressure, etc.)

Recommended prior knowledge :

Physics 1&3

Content of the material

TP 1. Characteristics of a vibration, Standards

TP 2. Measurements of a vibration and its impact on man / machine

TP 3. Pressure measurement, diagram reading (symbol)

TP 4. Means of protection against overpressure

TP 5. Study of a pressure installation (hydraulic/pneumatic)

Assessment method:

Continuous assessment: 100%.

Bibliographic references:

- ***BERTHOZ.*** *Effects of vibrations on humans. In SCHERER, Outline of Physiology of Work, MASSON.*
- ***INRS.*** *Industrial vibrations. ED.*
- ***JAYAT, ROURE and BITSCH.*** *Angio-neurotic disorders caused by vibrations of hammer drills. MASSON.*

Semester: 1

Teaching unit: UEM 1.1

Subject 3: Risk Management

VHS: 10:30 p.m. (lesson: 1 hour 30 minutes)

Credits: 2

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

- From risk management to risk management (ISO 31000)
- Important aspect of risk communication and information for populations
- Project risk cases

Assessment method:

Review: 100%.

Bibliographic references

Semester: 1

Teaching unit: UEM1.1

Subject 4: Practical work Dangers Lifting and handling

VHS: 10:30 p.m., (TP: 1:30 p.m.)

Credits: 2

Coefficient: 1

Teaching objectives:

Study the characteristics of an overhead crane and learn the lifting and handling operations as well as the risks that result from them.

Recommended prior knowledge :

Physics 1 & 3

Content of the material

TP 1. Study of the characteristics of the overhead crane.

TP 2. Determination of the sling angle.

TP 3. Study of the phenomenon of load swinging and anti-swaying.

Assessment method:

Continuous assessment: 100%.

Bibliographic references:

- ***International Organization for Standardization.*** *ISO 11228-1 International Standard, Ergonomics – Manual handling – Part 1: Vertical and horizontal handling, 1st ed., Geneva, 2003.*

Semester: 1

Teaching unit: UED 1.1.
Subject 1: ……..

VHS: 10:30 p.m., Course: 1.5
hours Credits: 1

Coefficient: 1

Teaching objectives:

Recommended prior knowledge :

Content of the material

Assessment method:

Exam: 100%.

Bibliographic references:

Semester: 1

Teaching unit: UED 1.1.
Subject 2:……

VHS: 10:30 p.m., class: 1.5 hours
Credits: 1
Coefficient: 1

Teaching objectives:

Recommended prior knowledge :

Content of the material

Assessment method:

Exam: 100%.

Bibliographic references

Semester: 1

Teaching unit: UET1.1

Subject 1: Technical English and Terminology

VHS: 10:30 p.m. (Class: 1.5 hours)

Credits: 1

Coefficient: 1

Teaching objectives:

Introduce students to technical vocabulary. Strengthen their language skills. Help them understand and summarize a technical document. Enable them to understand a conversation in English held in a scientific setting.

Recommended prior knowledge:

Basic English Vocabulary and Grammar

Content of the material:

- Written comprehension: Reading and analysis of texts relating to the specialty.

- Oral comprehension: Based on authentic popular science video documents, note-taking, summary and presentation of the document.

- Oral expression: Presentation of a scientific or technical subject, development and exchange of oral messages (ideas and data), Telephone communication, Gestural expression.

- Written expression: Extracting ideas from a scientific document, Writing a scientific message, Exchanging information in writing, writing CVs, letters of application for internships or jobs.

Recommendation: It is strongly recommended that the subject manager present and explain at the end of each session (at most) around ten technical words of the specialty in the three languages (if possible) English, French and Arabic.

Assessment method:

Review: 100%.

Bibliographic references:

1. PT Danison, Practical guide to writing in English: usages and rules, practical advice, Editions d'Organisation 2007
2. A.Chamberlain, R. Steele, Practical Guide to Communication: English, Didier 1992
3. R. Ernst, Dictionary of Applied Technology and Sciences: French-English, Dunod 2002.
4. J. Comfort, S. Hick, and A. Savage, Basic Technical English, Oxford University Press, 1980

IV - Detailed program by subject for semester S2

Semester: 2

Teaching unit: UEF 1.2.1

Subject 1: Safety of operation of systems 1

VHS: 45h00 (Lecture: 1h30, Tutorial: 1h30)

Credits: 4

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the material:

- Introduction to the Functional Safety (FS) of systems: definition, historical overview, interests and challenges of the FS
- Foundations of SdF:
- Obstacles, Attributes and Methods
- Inductive/deductive approaches to SdF
- Study sequence of the SdF
- SdF objectives and allocation of its objectives
- SdF data
- Qualitative study of homeless people:
- Functional analysis of systems using the following methods: DBF, SADT, AF, etc.
- Dysfunctional analysis of systems using the following methods: APR, AMDEC, HAZOP

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references: .

Semester: 2

Teaching unit: UEF 1.2.1

Subject 2: Process safety: mechanical/electrical risks

VHS: 45h00 (Lecture: 1h30, Tutorial: 1h30)

Credits: 4

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the material:

Part A: Electrical/Mechanical Hazards (5 weeks)

Chapter 1. The effects of leakage currents on the individual, Dangers of electrical origin.

Chapter 2. The different leakage regimes, capacitive leaks, resistive leaks.

Chapter 3. Detect and assess the dangers of electrical installations and equipment, implement the protection of people and installations against electric shocks,

Chapter 4. Detection and assessment of mechanical hazards in installations using manual, mechanized and high-risk lifting handling.

Chapter 5. Hydraulic and pneumatic installations under pressure; work in confined, enclosed spaces or at heights.

- Characterization and specificity of mechanical and electrical risks
- Risk of machinery and electrical installations
- Mechanical risk prevention approach: machine safety
- Electrical authorization process

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references:

Semester: 2

Teaching unit: UEF 1.2.2

Subject 1: Life cycle analysis and eco-design

VHS: 67h30 (Lecture: 3h00, Tutorial: 1h30)

Credits: 6

Coefficient: 3

Teaching objectives:

Recommended prior knowledge:

Content of the material:

- Concepts and terminology
- Methodology
- ICV vs. ACV
- Life cycle impacts
- Importance of eco-design
- Eco-design methods

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references:

Semester: 2

Teaching unit: UEF 1.2.2

Subject 2: Diagnosis of industrial systems failures

VHS: 45h00 (Lecture: 1h30, Tutorial: 1h30)

Credits: 4

Coefficient: 2

Teaching objective:

Recommended prior knowledge:

Content of the material:

- Concepts and Terminology of Failure Diagnosis
- Diagnostic methods
- Decision and diagnosis,

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references:

Semester: 2

Teaching unit: UEM 1.2

Subject 1: Computer software dedicated to industrial security

VHS: 37h30 (Lecture: 1h30, Practical work: 1h00)

Credits: 3

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the material:

- Workstation study software (e.g. CAPTIV)
- Risk perception software (e.g. SPSS, R+)
- System safety software (Example: LAAS, MocaRP, etc.)
- Risk analysis software (Example: GIS, Fluent, ALLOHA, PHAST, etc.)

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Semester: 2

Teaching unit: UEM1.2 Subject 2:

Electrical/Mechanical Dangers VHS: 22h30, Practical work: 1h30 Credits: 2

Coefficient: 1

Teaching objectives:

Learn the methodology for monitoring the insulation status of electrical networks and their level of insulation from the ground, taking into account capacitive and resistive components.

Recommended prior knowledge :

Handling an insulation tester and an ohmmeter for calculating an earth connection.

Content of the material

- Physical simulation of a three-phase electrical network on stand.
- Detection of leakage current -

Evaluation of the insulation status of an electrical network.

Assessment method: Continuous assessment: 100%.

Bibliographic references:

- **CHOQUET.** R. Electrical safety. Prevention techniques. DUNOD.
- **FOLLIOT.** D. Accidents of electrical origin and their prevention. MASSON.
- **INRS.** Main terms in electrical engineering relating to safety. ED.

Semester: 2

Teaching unit: UEM 1.2

Subject 3: Industrial feedback and information monitoring

VHS: 10:30 p.m. (Class: 1.5 hours)
Credits: 2

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

- General information on REX (definition, origins and procedure for conducting REX)
- Fields of application (reliability data, identification of precursors, etc.)
- Knowledge management and knowledge capitalization methods in industrial safety

- Exploitation of REX by analysis based on cases
- Data mining
- Bayesian Approach Types
- and Signs of Watch
- monitoring process

Assessment method:

Review: 100%.

References:

Semester: 2

Teaching unit: UEM 1.2 Subject 4:

Information systems in HSI VHS: 22h30 (Course: 1h30)

Credits:
2 Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

1- Definition and basic concepts of Industrial Information Systems (IIS)

2- Architecture of the SII

3- SII security

3- Software related to SII

Assessment method: Exam: 100%.

References:

Semester: 2

Teaching unit: UED 2.1 Subject 1: VHS: 22h30

(Lecture: 1h30)
Credit: 1
Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

Assessment method:

Bibliographic reference

Semester: 2

Teaching unit: UED 2.1 Subject 2: VHS: 10:30 p.m.

(Course: 1:30 p.m.)
Credit: 1

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

Assessment method:

Bibliographic reference

Semester: 2
Teaching unit: UET 1.2
Subject: Compliance with standards and rules of ethics and integrity.
VHS: 10:30 p.m. (Class: 1.5 hours)
Credit: 1
Coefficient: 1

Teaching objectives:

To raise student awareness of the ethical principles and rules that govern life at university and in the workplace. Raise awareness of the need to respect and value intellectual property. Explain the risks of moral evils such as corruption and how to combat them, and alert them to the ethical issues raised by new technologies and sustainable development.

Recommended prior knowledge:

Ethics and professional conduct (the foundations)

Content of the subject:

A. Respect for the rules of ethics and integrity,

1. Reminder of the MESRS Ethics and Professional Conduct Charter: Integrity and honesty. Academic freedom. Mutual respect. Demand for scientific truth, objectivity and critical thinking. Fairness. Rights and obligations of the student, the teacher, administrative and technical staff,

2. Integrity and responsible research

- Respect for the principles of ethics in teaching and research
- Responsibilities in teamwork: Professional equality of treatment. Conduct against discrimination. The pursuit of the general interest. Inappropriate conduct in the context of collective work.

- Adopting responsible conduct and combating abuses: Adopting responsible conduct in research. Scientific fraud. Conduct against fraud. Plagiarism (definition of plagiarism, different forms of plagiarism, procedures to avoid involuntary plagiarism, detection of plagiarism, sanctions against plagiarists, etc.). Falsification and fabrication of data.

3. Ethics and professional conduct in the world of work:
Legal confidentiality in business. Corporate loyalty. Corporate responsibility. Conflicts of interest. Integrity (corruption in the workplace, its forms, consequences, methods of combating and sanctions against corruption).

B- Intellectual property

I- Fundamentals of intellectual property 1.
Industrial property. Literary and artistic property.
2. Rules for citing references (books, scientific articles, communications at a conference, theses, dissertations, etc.)

II- Copyright

1. Copyright in the digital environment
Introduction. Database copyright, software copyright. Specific case of free software.

2. Copyright in the Internet and E-Commerce Domain Name Law.
Intellectual Property on the Internet. E-Commerce Website Law. Intellectual Property and Social Media.

3. Patent
Definition. Rights in a patent. Usefulness of a patent. Patentability. Patent applications in Algeria and around the world.

III- Protection and promotion of intellectual property

How to protect intellectual property. Rights infringement and legal tools.
Valorization of intellectual property. Protection of intellectual property in Algeria.

C. Ethics, sustainable development and new technologies

Link between ethics and sustainable development, energy saving, bioethics and new technologies (artificial intelligence, scientific progress, humanoids, robots, drones,

III- Protection and promotion of intellectual property (3 weeks)

How to protect intellectual property. Rights infringement and legal tools.
Valorization of intellectual property. Protection of intellectual property in Algeria.

Assessment method:
Exam: 100%

Bibliographic references:

1. Charter of University Ethics and Professional Conduct, https://www.mesrs.dz/documents/12221/26200/Charte+fran__ais+d__f.pdf/50d6de61-aabd- 4829-84b3-8302b790bdce
2. Order No. 933 of July 28, 2016 establishing the rules relating to the prevention and fight against plagiarism
3. The ABC of Copyright, United Nations Educational, Scientific and Cultural Organization culture (UNESCO)
4. E. Prairat, On teaching ethics. Paris, PUF, 2009.
5. Racine L., Legault GA, Bégin, L., Ethics and engineering, Montreal, McGraw Hill, 1991.
6. Siroux, D., Deontology: Dictionary of Ethics and Moral Philosophy, Paris, Quadrige, 2004, p. 474-477.
7. Medina Y., Ethics, what will change in the company, Editions d'Organisation, 2003.
8. Didier Ch., Thinking about the ethics of engineers, Presses Universitaires de France, 2008.
9. Gavarini L. and Ottavi D., Editorial. of professional ethics in training and research, Research and training, 52 | 2006, 5-11.
10. Caré C., Morality, ethics, deontology. Administration and education, 2nd quarter 2002, no. 94.
11. Jacquet-Francillon, François. Concept: professional ethics. Letélémaque, May 2000, no. 17
12. Carr, D. Professionalism and Ethics in Teaching. New York, NY Routledge. 2000.
13. Galloux, JC, Industrial Property Law. Dalloz 2003.
14. Wagret F. and JM., Patents, trademarks and industrial property. PUF 2001
15. Dekermadec, Y., Innovating through patents: a revolution with the internet. Insep 1999
16. AEUTBM. The engineer at the heart of innovation. Belfort-Montbéliard University of Technology

17. Fanny Rinck etléda Mansour, Literacy in the digital age: copy-paste among students, Grenoble 3 University and Paris-Ouest Nanterre La Défense University, Nanterre, France
18. Didier DUGUEST IEMN, Citing your sources, IAE Nantes 2008
19. Similarity detection software: a solution to electronic plagiarism? Report of the Working Group on Electronic Plagiarism presented to the CREPUQ Subcommittee on Pedagogy and ICT
20. Emanuela Chiriac, Monique Filiatrault and André Régimbald, Student Guide: Intellectual Integrity, Plagiarism, Cheating and Fraud… Avoiding Them and, Above All, How to Properly Cite Your Sources, 2014.
21. Publication of the University of Montreal, Strategies for preventing plagiarism, Integrity, fraud and plagiarism, 2010.
22. Pierrick Malissard, Intellectual Property: Origin and Evolution, 2010.
23. The website of the World Intellectual Property Organization www.wipo.int
24. http://www.app.asso.fr/

V - Detailed program by subject for semester S3

Semester: 3

Teaching unit: UEF 2.1.1

Subject 1: Safety of operation of systems 2

VHS: 45h00 (Lecture: 1h30, Tutorial: 1h30)

Credits: 4

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Quantitative study of homeless people:
- Dysfunctional analysis of systems using so-called static methods: AdD
- Combinatorial analysis of systems using so-called static methods: AdE
- Combinatorial analysis of systems using so-called dynamic methods: Markov chains (homogeneous and non-homogeneous) and Petri nets (discrete and continuous)

Assessment method:

Exam: 60% , continuous assessment: 40%

Bibliographic references:

Semester: 3

Teaching unit: UEF 2.1.1
Subject 2: Decision-making tools

VHS: 45h00 (Lecture: 1h30, Tutorial: 1h30)
Credits: 4

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Introduction to decision-making support (definition, issues and difficulties)
- Decision-making process
- Decision-making support methods (qualitative & quantitative methods)
- Case of decision making in projects
- Case of agile decision-making.

Assessment method:

Exam: 60% , continuous assessment: 40%

Bibliographic references:

Semester: 3

Teaching unit: UEF 2.1.2
Subject 1: Functional safety

VHS: 45h00 (Lecture: 1h30, Tutorial: 1h30)
Credits: 4

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Fundamentals of Functional Safety of Systems
- Standards dedicated to functional safety
- Specific standards dedicated to machine safety
- Generic standards dedicated to intelligent safety systems (safety instrumented systems)

Assessment method:

Exam: 60% , continuous assessment: 40%

Bibliographic references:

Semester: 3

Teaching unit: UEF 2.1.2

Subject 2: Statistical process control

VHS: 67h30 (Lecture: 3h00, Tutorial: 1h30)

Credits: 6

Coefficient: 3

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Definition and foundations of MSP
- Foundations of MSP (monitoring and management of processes using control charts and their assessment by capability)
- MSP Methods
- Industrial cases

Assessment method:

Exam: 60% , continuous assessment: 40%

Bibliographic references:

Semester: 3

Teaching unit: UEM 2.1

Subject 1: Integrated risk analysis methods

VHS: 37h30 (Lecture: 1h30, Practical work: 1h00)
Credits: 3

Coefficient: 2

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Limits of traditional risk analysis methods (AMDEC, APR, etc.)
- Complementarity between classic risk analysis methods
- Advantages of integrated risk analysis methods (possibility of combining classic methods into a single, so-called integrated method)
- MADS-MOSAR method
- ARAMIS Method
- LOPA method
- BORA Method
- QRA

Assessment method:

Exam: 60% , continuous assessment: 40%

Bibliographic references:

Semester: 3

Teaching unit: UEM 2.1
Subject 2: Safety Culture

VHS: 10:30 p.m. (Class: 1.5 hours)
Credits: 2

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Industrial safety skills
- Organizational Culture vs. Safety Culture
- Foundations of safety culture (regulated safety and managed safety, bottom-up and top-down stakeholder engagement)
- Human behavior in work situations (assessment focused on compliance with work procedures, support tool like the PostCard).

Assessment method:
Exam: 100%

Bibliographic references:

Semester: 3

Teaching unit: UEM 2.1
Subject 3: Industrial maintenance

VHS: 10:30 p.m. (Class: 1.5 hours)
Credits: 2

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Definition and forms of maintenance
- Function and Maintenance Service
- Maintenance issues (maintenance and safety, maintenance and quality, maintenance and environment)
- Methods dedicated to maintenance (technical and organizational methods)
- Maintenance management: the case of outsourcing (subcontracting)

Assessment method:
Exam: 100%

Bibliographic references:

Semester: 3

Teaching unit: UEM 2.1 Subject 4: Audit, Certification, Accreditation and Compliance VHS: 22h30 (TP: 1h30)

Credits: 2

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the subject:

- Common aspects between “audit – certification – accreditation – compliance”
- Appropriate steps

Assessment method:

Continuous assessment: 100%

Bibliographic references:

Semester: 3

Teaching unit: UED 2.1 Subject 1: VHS: 22h30

(Lecture: 1h30)
Credit: 1

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

Assessment method:

Bibliographic reference

Semester: 3

Teaching unit: UED 2.1 Subject 2: VHS: 10:30 p.m.

(Course: 1:30 p.m.)
Credit: 1

Coefficient: 1

Teaching objectives:

Recommended prior knowledge:

Content of the material:

Assessment method:

Bibliographic reference

Semester: 3

Teaching unit: UET 2.1

Subject 1: Documentary research and dissertation design

VHS: 10:30 p.m. (Class: 1.5 hours)

Credits: 1

Coefficient: 1

Teaching objectives :

To give students the tools they need to research useful information and use it more effectively in their final year project. To help them navigate the various stages of writing a scientific document. To demonstrate the importance of communication and to teach them how to present their work in a rigorous and educational manner.

Recommended prior knowledge: Writing methodology, Presentation methodology.

Content of the material:

Part I-: Documentary research:

Chapter I-1: Definition of the subject **(2 Weeks)**

- Subject title
- List of keywords related to the subject
- Gather basic information (acquisition of specialized vocabulary, meaning of terms, linguistic definition)
- The information sought
- Take stock of your knowledge in the field

Chapter I-2: Selecting information sources - Type of documents **(2 Weeks)**

(Books, Theses, Dissertations, Periodical articles, Conference proceedings, Audiovisual documents, etc.)

- Type of resources (Libraries, Internet, etc.)
- Evaluate the quality and relevance of information sources

Chapter I-3: Locating documents **(01 Week)**

- Research techniques
- Search operators

Chapter I-4: Processing information **(2 Weeks)**

- Work organization
- The starting questions
- Summary of the documents selected
- Links between different parties
- Final plan of the documentary research

Chapter I-5: Presentation of the bibliography **(01 Week)**

- Systems for presenting a bibliography (The Harvard system, The system Vancouver, The mixed system…)
- Presentation of documents.
- Citation of sources

Part II: Memory Design

Chapter II-1: Plan and stages of the report **(2 Weeks)**

- Identify and delimit the subject (Summary)
- Problems and objectives of the thesis
- Other useful sections (Acknowledgments, Table of abbreviations, etc.)
- The introduction *(Writing the introduction last)*
- State of the specialized literature
- Formulation of hypotheses
- Methodology
- Results
- Discussion
- Recommendations
- Conclusion and perspectives
- The table of contents
- The bibliography
- The annexes

Chapter II-2: Writing Techniques and Standards - Formatting. **(2 Weeks)**

Numbering of Chapters, Figures and Tables.

- The cover page
- Typography and punctuation
- Writing. Scientific language: style, grammar, syntax.
- Spelling. Improvement of general linguistic competence in terms of comprehension and expression.
- Save, secure, archive your data.

Chapter II-3: Workshop: Critical study of a manuscript **(01 Week)**

Chapter II-4: Oral presentations and defenses - How **(01 Week)**

to present a poster

- How to present an oral communication.
- Defense of a dissertation

Chapter II-5: How to avoid plagiarism ? **(01 Week)**

(Formulas, sentences, illustrations, graphs, data, statistics, etc.)

- The quote
- The paraphrase
- Indicate the complete bibliographic reference

Assessment method:

Exam: 100%

Bibliographic references:

1. *M. Griselin et al., Guide to Written Communication, 2nd edition, Dunod, 1999.*
2. *JL Lebrun, Practical guide to scientific writing: how to write for the international scientific reader, Les Ulis, EDP Sciences, 2007.*
3. *A.Mallender Tanner, ABC of technical writing: user guides, instructions, online help, Dunod, 2002.*
4. *M. Greuter, How to write your dissertation or internship report well, L'Etudiant, 2007.*
5. *M. Boeglin, Reading and Writing at University. From the Chaos of Ideas to Structured Text. L'Etudiant, 2005.*
6. *M. Beaud, the art of the thesis, Editions Casbah, 1999.*
7. *M. Beaud, the art of the thesis, La découverte, 2003.*
8. *M. Kalika, Master's thesis, Dunod, 2005.*

CHOICE OF SUBJECT PROGRAMS

Subject: Major risks
VHS: 10:30 p.m., Class: 1:30 a.m.
Credits: 1
Coefficient: 1

Teaching objectives:

Learn how to manage major risk situations.

Recommended prior knowledge :

Risk analysis methods, crisis management.

Content of the material

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, interventions after the accident. **(3 weeks)**

Assessment method:

Exam: 100%.

Bibliographic references:

- *Nichan Margossian, Major Industrial Risks and Accidents, The new factory, 2006, Dunod*

Subject: Fire Risk Prevention and Detection
VHS: 10:30 p.m., class: 1:30 p.m.
Credits: 1
Coefficient: 1

Teaching objectives:

Recommended prior knowledge :

Fire risks in businesses

Content of the material

Chapter 1. Fire prevention, basic general knowledge **(3 weeks)**

Chapter 2. Fire Behavior **(3 weeks)**

Chapter 3. Building design, insulation, fire stability of structures **(3 weeks)**

Chapter 4. Compartmentalization, principles and objectives, smoke extraction (3 weeks)

Chapter 5. Detection, rescue means and interventions (3 weeks)

Assessment method:

Continuous assessment: 40%; Exam: 60%.

Bibliographic references

1. Detection, extinction and instruction plans, Editions CNPP-France, 15th edition, 2014, 224 pages.
2. Fire safety instructions: instructions for use. Editions CSTB-France, 2013, 218 pages.