Study Plan

School: School of Sciences and Technology
Degree: Bachelor
Course: Renewable Energies Engineering (cód. 486)

1st Year - 1st Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
MAT00905L	Mathematical Analysis I	Mathematics	6	Semester	162
MAT00900L	Linear Algebra and Geometry I	Mathematics	6	Semester	156
FIS00703L	General Physics I	Physics	6	Semester	158
QUI01090L	General Chemistry	Chemistry	6	Semester	156
INF00878L	Programming	Informatics	6	Semester	156

1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
MAT00906L	Mathematical Analysis II	Mathematics	6	Semester	162
MAT00925L	Introduction to Probability and Statistics	Mathematics	6	Semester	154
FIS00704L	General Physics II	Physics	6	Semester	158
EME00528L	Applied Thermodynamics	Mechanical Engineering	6	Semester	156
FIS00522L	Mechatronics System Design	Mechanical Engineering	6	Semester	156

2nd Year - 3rd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
MAT00907L	Mathematical Analysis III	Mathematics	6	Semester	162
FIS01803L	Applied Electronics	Electrotechnical Engineering	6	Semester	156
FIS00510L	General Electrotechnics	Electrotechnical Engineering	6	Semester	156
FIS00524L	Applied Mechanics	Mechanical Engineering	6	Semester	156
FIS10927L	Fluid Mechanics	Mechanical Engineering	6	Semester	156

2nd Year - 4th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
FIS00525L	Mechanics of Materials	Mechanical Engineering	6	Semester	156
FIS00512L	Electrical Machines	Electrotechnical Engineering	6	Semester	156
EME00506L	Control and Automation	Electrotechnical Engineering	6	Semester	156

2nd Year - 4th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
FIS01811L	Environment Energy and Sustainability	*** TRANSLATE ME: Projecto e Automação Industrial ***	6	Semester	156
EME10987L	Energy and Mass Transfer	Mechanical Engineering	6	Semester	156

3rd Year - 5th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
EME01805L	Solar Thermal Energy	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
EME01808L	Wind Energy	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
EME01809L	Ocean Energy	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
EME10989L	Photovoltaic Solar Energy	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
EME10990L	Bioenergy and Biofuels	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
EME10928L	* Project of Energy Systems	Electrotechnical Engineering Mechanical Engineering	12	Semester	312

3rd Year - 6th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
EME10928L	Project of Energy Systems	Electrotechnical Engineering Mechanical Engineering	12	Semester	312
EME01812L	Energy Storage	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
FIS01813L	Electric Energy Systems	Electrotechnical Engineering	6	Semester	156

3rd Year - 6th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours

Group of Options

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
FIS01814L	Energy in the Building Sector	Electrotechnical Engineering Mechanical Engineering	6	Semester	156
FIS01815L	New Energetic Vectors	Mechanical Engineering	6	Semester	156
FIS01816L	Geothermics	Mechanical Engineering	6	Semester	156
GES00027L	Organizational Behaviour and Human Resources Management	Management	6	Semester	157
GES10929L	Principles of Management	Management	4	Semester	112
PED00418L	Communication in Professional Context	Education Sciences	2	Semester	52

Conditions for obtaining the Degree:

*** TRANSLATE ME: Engenharia de Energias Renováveis

Para obtenção do grau de licenciado em Engenharia de Energias Renováveis é necessário obter aprovação a 174 ECTS em unidades de curriculares obrigatórias e 6 ECTS em unidades curriculares optativas distribuídas da seguinte forma:

1º Ano

1º Semestre:

5 UC Obrigatórias num total de 30 ECTS

2º Semestre

5 UC Obrigatórias num total de 30 ECTS

2º Ano

3º Semestre

5 UC Obrigatórias num total de 30 ECTS

4º Semestre

5 UC Obrigatórias num total de 30 ECTS

3º Ano

5º Semestre

5 UC Obrigatórias num total de 30 ECTS

6º Semestre

3 UC Obrigatórias num total de 24 ECTS

1 UC Optativa num total de 6 ECTS ***

Program Contents

Back

Mathematical Analysis I (MAT00905L)

Back

Linear Algebra and Geometry I (MAT00900L)

Systems of linear equations.
Matrices.
Determinants.
Vector spaces.
Linear applications.
Eigenvalues and eigenvectors.
Geometry of plane and space.
Quadratic forms.

Back

General Physics I (FIS00703L)

Back

General Chemistry (QUI01090L)

1. Constitution of matter
2. Periodic table
3. Chemical bonding
4. States of aggregation of matter
5. Solutions
6. Chemical thermodynamics
7. Chemical equilibrium
8. Equilibrium in heterogeneous systems
9. Ionic equilibria in homogeneous systems: acid-base
10. Electrochemistry
11. (Optional Chapter)

Chemistry of life
Chemical corrosion
Chemical kinetics

Back

Programming (INF00878L)

Introduction to programming in Python.
Using the interpreter in script and interactive mode.
Variables, expressions and instructions.
Definition and Use of Functions.
Control structures.
Native data structures.
Sequential data structures: lists, tuples, and strings.
Associative data structures: dictionaries.
Basic concepts of input / output (I / O).
File manipulation.
Graphic interface.
Using to libraries / modules.
Libraries with advanced functionality for scientific calculation.
Program development.

Back
Mathematical Analysis II (MAT00906L)

Back
Introduction to Probability and Statistics (MAT00925L)
Descriptive StatisticsBasic Probability NotionsConditional probabilities and independence Random Variables and VectorsMore important Discrete and Continuous distributionsStatistical Inference (parametric and non parametric)Linear Regression Analysis

Back
General Physics II (FIS00704L)

Back
Applied Thermodynamics (EME00528L)
Chapter 1 - Basic Concepts of Thermodynamics

Chapter 2 - Energy and the 1st Law of Thermodynamics

Chapter 3- Calculating Properties. Using tables

Chapter 4- Open Systems. Control Volumes

Chapter 5 - 2nd Law of Thermodynamics. Entropy.

Chapter 6- Steam Power Systems

Back

Mechatronics System Design (FIS00522L)

» Technical Drawing as a language{\}newline
The importance of Technical Drawing and standardization. Types of technical drawings and representations. Main associated standards: paper formats, scales, line types, line thicknesses, text and layouts.{\}newline
{\}newline
» Elaborating technical drawings{\}newline
The concept of projection, orthogonal projections, views and multiple views representations. Freehand drafting. Perspective drawing in general and based on orthogonal projections. Reading of multiple views drawings. Partial and auxiliary views. Computer aided drafting of orthogonal views and 3D models.{\}newline
{\}newline
» Section views{\}newline
Using sections as a mean to simplify the drawing reading. General rules for section drawings and conventional representations. Assembly drawings.{\}newline
{\}newline
» Introductory concepts of design{\}newline
The several stages present in the design process and the associated documentation. Material properties and manufacturing processes. Some insights and details in the design of structures and mechatronic equipments. The use of standard components in design and its drawing representations, bolts, washers, rivets, springs, bearings, couplings, valves, actuators, etc.{\}newline
{\}newline
» Dimensioning{\}newline
Writing dimensions and other information in drawings. Different dimensioning criteria according to the drawing purpose.{\}newline
{\}newline
» Tolerances{\}newline
Dimensional tolerancing, linear tolerances, angular tolerances and fits. Surface and edge finishes. Geometrical tolerancing, application and interpretation. Verification processes and methods.{\}newline
{\}newline
» Drawing of connections{\}newline
Brief description of welding processes. Welded, bolted and riveted connections. Types of welding, associated symbols and annotation rules. Associated standards and the elaboration of complete parts lists.{\}newline
{\}newline
» Introduction to the drawing of technical diagrams{\}newline
Symbolic representation of mechanical components, electrical wiring diagrams, piping, pneumatic and hydraulic network diagrams, thermal systems and manufacturing processes layouts.

Mathematical Analysis III (MAT00907L)

1. Elements of Differential Geometry in R3
1.1. General information on the space Rn
1.2. Contours and parameterized curves
1.3. Length of arc. Parameterization by arc length
1.4. Curvature and torsion. Frenet-Serret formulas
1.5. Surfaces.
1.6. Tangent plane and normal line to a surface. Orientability.
2. Introduction to Complex Analysis
2.1. General.
2.2. Complex functions and analytic functions.
2.3. Cauchy-Riemann equations.
2.4. Laplace equation. Harmonic functions.
2.5. Geometry of analytic functions. ConformalÂ transformation.
2.6. Elementary complex functions.
(I) Exponential function
(Ii) trigonometric and hyperbolic functions
(Iii) logarithm function
(Iv) Generalized complex powers functions
2.7. Complex integration
(I) Path Integral
(Ii) Elementary properties
2.8. Fundamental Theorem of Calculus.
2.9. Cauchys theorem and its evolution.
2.10. Cauchy integral formula and applications
3. Ordinary Differential Equations
3.1. Definitions and generalities.
3.2. Exact equations and integrating factors.
3.3. Basic equations of 1st order
(I) equation with separable variables
(Ii) homogeneous equation
(Iii) homographic Equation
(Iv) linear equation of 1st order
(V) Bernoulli Equation
(Vi) Ricati Equation
3.4. Linear equations of 2nd order
(I) reduction of order.
(Ii) Particular solution of the nonhomogeneous equation
(Iii) homogeneous equation with constant coefficients
4. Systems of ordinary differential equations
4.1. Introduction and notations
4.2. Linear systems
4.3. Systems with constant coefficients
4.4. Linear periodic systems
4.5. Asymptotic behavior of solutions for linear systems.
4.6. Stability of solutions
4.7. Planar autonomous systems
5. Fourier series
5.1. Periodic functions.
5.2. Trigonometric series.
5.3. Euler formulas for Fourier coefficients.
5.4. Orthogonality.
5.5. Uniform convergence
5.6. Convergence and the sum of the Fourier series.
5.7. Functions with a generic period 2L
5.8. Expansion in series of sines and cosines
5.9. Periodic extensions
5.10. Complex Fourier series.
5.11. Fourier integrals.

Back

Applied Electronics (FIS01803L)

1. Introduction
Objectives and application examples.

2. Power Electronic Devices
Diode, Tiristor, GTO, BJT, MOSFET, IGBT
Devices characteristics comparison

3. AC/DC Converters - Rectifiers
Analysis of different topologies
Power Flow. Power Factor

4. AC/AC Converters
Cicloconverters: Topology and functioning principles
Static Converters: Functioning as switch and with phase control

5. DC/DC Converters - "Chopper"
Analysis of different topologies

6. DC/AC Converters - Inverters
Voltage Inverters: one and three phases topologies; Power Flow
Current Inverters

7. Regulation and Command of Power Converters
P;PI;PID Controllers. Regulation Circuits.
PWM Command. Tiristors, Transistors and IGBT's Command Circuits.

Back

General Electrotechnics (FIS00510L)

1. Introduction

2. Fundamental notions of electrostatics
Electric charge; Electrostatic force; Coulomb's law.
Electric field; Electric potential; Electric voltage.
Capacitors and dielectrics; capacitors in series and parallel.
Application of Maxwell's equations to electrostatics.

3. Stationary Electric Current
Current density and Electric current intensity.
Electric resistance; Ohm's law; Resistors in series and parallel; Voltage and Current dividers.
Electrical energy sources; Voltage and current sources; Independent sources and controlled sources; Electric circuits; Power and Energy; Joule's law.
Analysis of direct current circuits. Kirchhoff's laws. Superposition theorem. Norton and Thèvenin theorems. Maximum power transfer theorem. Bridge circuits; Star-Triangle and Triangle-Star transformations.

4. Magnetostatics
Magnetic materials classification.
Maxwell equations applied to magnetostatics
Ampère's law; Magnetic flux. Magnetomotive force; Magnetic reluctance. Magnetic saturation. Inductors; Inductors in series and parallel.
Magnetic circuits analysis. Analogy between electric and magnetic circuits.

5. Varying Electromagnetic Field
Faraday's law.
Self and Mutual induction coefficients. Ideal transformer.
Mechanical generators of electric energy. Basic principles of electric machines (Força de Laplace).

6. Quasi Steady State Circuits
Fundamental notions: sinusoidal voltages and currents; average and rms values; complex or symbolic representation of a sinusoidal function.
Analysis of single-phase steady state alternating current circuits. Kirchhoff's law. Superposition theorem. Norton and Thèvenin theorems. Maximum power transfer theorem.
R; RL; RC; RLC circuits. Defenition of impedance and admitance. Impedances in series and parallel.
Active, Reactive and Apparent Power. Power factor.
Introduction to the dynamic behavior of electric circuits.

7. Three-Phase Systems
Star and Triangle connections; Star-Triangle and Triangle-Star transformations.
Line and Phase voltage and currents; Circuit analysis with different loads.
Active, Reactive and Apparent Power. Unbalanced loads.

Back

Applied Mechanics (FIS00524L)

Introduction to Mechanics

What is Mechanics, its fundamental laws and concepts. Vectors, properties and operations. The concept of particle. Parallelogram law for the addition of forces. Resultant force of concurrent forces, force vector components and rectangular Cartesian components, in 2D and 3D. Free body diagram of a particle and the corresponding static equilibrium equations in 2D and 3D.

Equivalent systems of forces

The concept of rigid body. Definition of moment of a force about a point and about an axis. The concept of couple and its representation by a vector. Reduction of a system of forces, point wise or distributed, to one equivalent resultant force and resultant couple. Definition of equivalent systems of forces, reduction to only one force or to a force and wrench. Distributed forces and their equivalent force-couple system.

Static equilibrium of rigid bodies

Equations governing the static equilibrium of rigid bodies in 2D and 3D. Free body diagrams and the reaction or connection forces developed by the supports and connections. Constraints imposed by the supports and other connections, and the reactions statically determinacy or indeterminacy. Resultant forces exerted by a fluid on submerged surfaces.

Centers of mass and centroids

The concept of center of mass of a body and determination of its location. Determination of centroids of volumes, areas and lines. Centers of mass and centroids by composition of features. Application to the study of distributed loads.

Analysis of rigid body structures

Static analysis of trusses 2D and 3D using nodal equilibrium or the equilibrium of sections. Analysis of structures, machines and mechanisms, in 2D and 3D. Statically determinate and indeterminate structures. Introduction to the study of gear transmissions.

Internal forces in bars, beams and cables

The concept of bars, beams and cables and internal forces. Determination and drawing of axial force, shear forces, bending moments and torque diagrams in 2D and 3D. Static equilibrium of cables with simple concentrated and distributed loads.

Analysis of rigid body structures in the presence of friction

Definition of friction and friction forces. The laws of dry friction. Static equilibrium of structures in the presence of friction. Study of wedges, screws, sliding bearings, belts and cables.

Second moments and moments of inertia

Determination of the second moments, polar moment and radius of gyration of an area. The parallel axis theorem. The product of area (inertia) and the principal axis of area (inertia). Definition and computation of moments of inertia, products of inertia and radius of gyration for rigid bodies. The inertia tensor.

Introduction to dynamics

Fundamentals of rigid bodies kinematics. Equations of motion for rigid bodies in 2D. Applications introducing to the analysis of oscillatory systems.

Back

Fluid Mechanics (FIS10927L)

Introductory concepts: fluid properties, stresses, viscosity, surface tension, Newtonian and non-Newtonian fluids, flow classification. Fluid statics: hydrostatic equation, hydrostatic pressure distribution, hydrostatic force, hydrostatic moment, buoyancy and Archimedes principle, equilibrium and stability of immersed bodies. Volume control analysis, conservation of mass, momentum and energy, momentum equation, angular momentum equation. Differential forms: continuity, Navier-Stokes and energy equations. Euler's equation, Bernoulli's equation: static and stagnation pressures. Viscous flow. Transport in porous media and other complex flow structures. Pipe and ducts flow: head loss, turbulence, flow in multiple path pipe and duct systems, Moody diagram. Similitude and Modelling. Introduction to the Constructal Theory.

Back

Mechanics of Materials (FIS00525L)

Back

Electrical Machines (FIS00512L)

Introduction to the study of Electrical Machines Fundamental electromagnetic concepts and circuit analysis revisited. Principles of electromechanical energy conversion. Transformer Introduction constructive aspects. The one-phase transformer. The three-phase transformer. Special transformers. The self-transformer. Measurement transformers. Dynamic behaviour analysis. DC Machines Introduction and functioning principles. Generator functioning. Main characteristics. Application fields. Motor functioning. Main characteristics. Application fields. Dynamic behaviour analysis. AC Machines Asynchronous Machine. Constructive aspects and functioning principles. Three-phase induction machine. One-phase induction machine. Application fields. Dynamic behaviour analysis. Synchronous Machine. Constructive aspects and functioning principles. Generator study. Synchronous motor. Dynamic behaviour analysis. Special Electrical Machines PM Synchronous machine. Switched Reluctance Machine. Step Motor. Etc.

Back

Control and Automation (EME00506L)

PART I: Control Systems:
1) Mathematical models for Control: Electrical, Mechanical, Fluidic, Thermal.
2) Analysis of systems - Transfer Function representation:
i) Time-domain analysis -1st order, 2nd order and multiple order systems -. Stationary response. Stability criteria. P-Controller design using the Root Locus method.
ii) Frequency-domain analysis. Bode diagram. Stability. Gain and phase margins. P-Controller design using the Bode method.
iii) PID controller. Usual design methods.
3) Analysis of systems represented by State-space formulation: Linear systems stability.

PART II: Industrial Automation:
1) Industrial logic components: pneumatic, electric and electronic technology.
2) Programmable automation. Basic components: Processing Unit, sensors and actuators.
3) Automatic Systems: Combinatory and sequential. Design of sequential systems using GRAFCET.
4) Implementation of automatic systems using Siemens LOGO PLC. (Programmable Logic Controller). LAD-programming.

Back

Environment Energy and Sustainability (FIS01811L)

1. The Earth: subsystems and their interaction. The resources: content, availability and strategic importance. Duration of resources and their distribution.
2. Sustainability and use of resources: Biocapacity and ecological footprint, the ecological balance, the water footprint and the carbon footprint. Energy and sustainability: "life-cycle assessment"in the scope of sustainability. Diagnosis for the sustainability in Portugal.
3. Energy, entropy and exergy. Thermodynamic cycles.
4. Energy sources: fossil fuels, nuclear energy and alternative sources (renewable energy). Energy and exergetics analysis.
5. Energy markets. Energy efficiency.
6. Energy and environment: pollution, greenhouse effect and climate change.

Back

Energy and Mass Transfer (EME10987L)

1. Fundamentals of heat transfer. Conduction, convection and radiation.
2. Heat diffusion equation. Unidimensional heat conduction in steady state regime. Extended surfaces. Multidimensional heat conduction. Transient conduction and in media with internal heat generation. Analytical solutions and numerical methods.
3. Hydrodynamic and thermal boundary layers. Forced convection in internal and external flows in laminar and turbulent regimes. Calculation of the heat transfer coefficient for different geometries. Natural convection.
4. Heat exchangers. Method of the logarithmic mean temperature difference and efficiency method (epsilon-NTU). Analysis of heat sinks.
5. Radiative properties of surfaces. Black bodies and real bodies. Planck's Law. Stefan-Boltzmann and Wien Laws. Kirchhoff's Law. Radiative exchange between surfaces. View factors. Calculation methods.
6. Fundamental concepts of mass transfer and analogy with heat transfer.

Back

Solar Thermal Energy (EME01805L)

Back

Wind Energy (EME01808L)

Back

Ocean Energy (EME01809L)

The ocean as a physical system. Main mechanisms that force the ocean movements. Thermodynamic properties of the seawater. Ocean dynamics. Ocean hydrokinetic energy conversion. Ocean hydro-potential energy conversion. Ocean thermal gradient energy conversion. Ocean salinity gradient energy conversion. Other forms: deuterium and nuclear fusion; near and offshore wind energy conversion.

Back

Photovoltaic Solar Energy (EME10989L)

1. Introduction.
The Physics of the Photovoltaic (PV) conversion.
PV Conversion technologies.
2. Photovoltaic systems.
Stationary systems and systems with tracking.
Photovoltaic systems with energy storage.
3. Applications and Projects.
Types of applications: autonomous (off grid), on grid, building integrated (BIPV), floating photovoltaic systems, photovoltaic irrigation and others (water purification, telecommunications systems, electric vehicles).
Design and energetic analysis of photovoltaic systems.
Testing and Monitoring Standards for Photovoltaic Systems.
Modeling of photovoltaic systems.
4. New Trends.
Photovoltaic Systems and Smart Grids
New technologies for photovoltaic systems and applications, new energy storage technologies.

Back

Bioenergy and Biofuels (EME10990L)

1. Status of the Portuguese, European and World bioenergy: Statistics. Strategies.
2. Biomass as a fuel: Carbon cycle. Concept of bioenergy. Energy potential of biomass (virgin and residues). Conversion processes.
3. Handling and treatment of farming and agri-industry effluents: Legislation. Effluents types. Characterisation and production quantities. Handling systems. Storage facilities. Valorisation and treatment systems (compost, separation, etc.).
4. Physical processes for biomass conversion: dehydration and drying. Size reduction. Densification. Separation.
5. Biofuel production: bioethanol, biomethanol, biodiesel and biogas production.
6. Thermal energy production from biomass: combustion, gasification and pyrolysis.
7. Electricity production from biomass: Rankine, Brayton, Otto, Diesel and dual cycles. Combined cycle. Cogeneration.
8. Legislation for the biomass sector.

Back

Project of Energy Systems (EME10928L)

Back

Energy Storage (EME01812L)

Back

Electric Energy Systems (FIS01813L)

Fundamental concepts: Per-unit system; Charge diagrams.

Transformer: electrical parameters; Scheme equivalent; numerical applications.

Power transmission line: Electric Line Parameters: Resistance and inductance, transverse conductance and capacity.

Equations of the long line; exact model; Scheme equivalent; Line lossless; Power carry capacity; numerical applications.

Transmission and distribution of electricity; Function; Configuration; voltage levels; constituent elements; one-line diagrams.

Short circuits: neutral systems; Calculation of short-circuit currents symmetrical and asymmetrical; Applications using numerical informatics platform; Techniques limitation of short circuit currents.

Standards, regulations and technical orders applicable to these systems, indicators of quality of service.

Back

Energy in the Building Sector (FIS01814L)

Back

New Energetic Vectors (FIS01815L)

1. Introduction
2. Hydrogen as energy carrier
3. Hydrogen production - electrolysis, thermolysis, photocatalytic production, thermochemical processes, gasification, steam reforming, biological processes. Integration of renewable energy sources. Centralized and decentralized production
4. Storage and transportation of hydrogen
5. Fuel cells - types and operation, energy analysis and efficiency. Applications
6. Safety and environmental impacts
7. Hydrogen economy
8. Synthetic fuels - Carbon neutral fuels and carbon negative fuels, production methods, carbon sources. Integration of renewable energy sources

Back

Geothermics (FIS01816L)

Introduction. The energy problem at world level. Geothermal energy.
Heat flow lost by the Earth by conduction
The role of water circulation in geothermal reservoirs
Radiation heat transfer. Convection. Viscosity.
Some notions of thermodynamics.
Introduction to the geothermal prospecting . Geochemistry. Introduction to geophysical prospecting.
Reserves and resources. Uncertainty associated with estimates.
Some considerations about the history of geothermal electricity production. Production of electricity.
Geothermal pumps. Some applications.
Use of geothermal reserves and environmental problems.
Geothermal energy in the future: main problems to solve.

Back

Organizational Behaviour and Human Resources Management (GES00027L)

Module 1. Organizational Behaviour and Human Resources Management: delimitation and areas of fork of the two areas
Module 2. Leadership and Power
Module 3. Motivation and satisfaction in the work
Module 4. Organizational Communication
Module 5. Participation and negotiation
Module 6. Culture and ethical organizational
Module 7. Tendencies of the organisational models
Module 8. The development of the work face to the legislation in vigour
Module 9. The human resources management (GRH) as sub-system of management system: Of the stages of the evolution of GRH to the main dimensions and politics of GRH
Module 10. Strategic Plan of human resources
Module 11. Recruitment, Selection and Integration
Module 12. Management systems and evaluation of the performance
Module 13. Reward Systems
Module 14. Systems of Health and Safety in the Work
Module 15. Formation Systems and Development of the human resources
Module 16. Information Management Systems of human resources (SIGRH)

Back

Principles of Management (GES10929L)

Module 1: Basic concepts and challenges
1.1 Concept definitions of organization, company and management
1.2 Business and individual cycle
1.3 Business stages and legal forms
1.4 Organizational structures

Module 2: Organizational areas
2. Strategy and Marketing
3. Operation and production management
4. Human capital and behavioural organizational dimensions
5. Operational planning and economic and financial management

Module 3: Cross sectional issues of management
6.1 Informational systems management
6.2 Quality management
6.3 Entrepreneurship and innovation management

Back

Communication in Professional Context (PED00418L)