Master in Renewable Energy in Electrical Engineering

1-Overview of the Program: Master in Renewable Energy in Electrical Engineering

The **Master in Renewable Energy in Electrical Engineering** is an advanced training program designed to prepare professionals capable of designing, managing, and optimizing renewable energy production systems. Here's a general overview of this program:

Program Objectives

- **Advanced Technical Training**: Provide an in-depth understanding of the principles of electrical engineering applied to renewable energies.
- **Sustainable Development**: Raise awareness of environmental issues and sustainable energy solutions.
- **Innovation**: Encourage research and development of new technologies in the field of renewable energy.

Program Content

The first semester is devoted to teaching the fundamental scientific and technical units in electrical engineering.

From the second semester onwards, a specialization in the renewable energies speciality with advanced teaching units.

The final semester is devoted to an end-of-study project:

1. **Fundamentals of Electrical Engineering**: Studies on electricity, electronics, and automation.
2. **Renewable Energy Technologies**: Training on solar, wind, hydroelectric, and geothermal energy.
3. **Energy Systems**: Analysis and design of energy production systems, including storage and distribution.
4. **Regulation and Standards**: Study of energy policies and safety standards.
5. **Practical Projects**: Applied research work and projects in partnership with industry stakeholders.

The course lasts two years, divided into four semesters.

Career Opportunities

Graduates can expect to find jobs in:

- Companies involved in renewable energy production and distribution.
- Engineering and consultancy firms.
- Government agencies and NGOs focused on sustainable energy.
- University research and development.

This Master's program prepares students to tackle current and future energy challenges, blending theory and practice in the dynamic field of renewable energy.

2-Key Strengths of the Curriculum

1. **Integration of Theory and Practice**
   The program combines solid theoretical courses with practical experiences, allowing students to acquire relevant skills in real-world environments.

2. **Cutting-Edge Technologies**
   Students are trained in the latest technologies related to renewable energy, covering areas such as photovoltaic solar energy, wind energy, and energy storage systems.

3. **Interdisciplinary Approach**
   The curriculum covers aspects from multiple disciplines, including engineering, economics, and environmental science, offering a holistic perspective on current energy challenges.

4. **Projects and Practical Work**
   Students engage in practical projects in collaboration with companies and research institutes, thereby enhancing their professional experience and employability.

5. **Management Skill Development**
   The program includes modules on project management, energy strategy, and sustainable management, preparing graduates for leadership roles in the sector.

6. **Networking and Career Opportunities**
   Connections with industry and strategic partnerships with leading companies in the field provide students with internship and job opportunities.

7. **Research Training**
   Students are encouraged to get involved in research work, contributing to innovation and advancements in the field of renewable energy.

8. **Awareness of Environmental Issues**
   The program places a strong emphasis on sustainable development and corporate social responsibility, raising students' awareness of global environmental challenges.

These strengths make the Master’s in Renewable Energy in Electrical Engineering an attractive program for those looking to engage in the dynamic field of sustainable energy.

3* admission information: details of admission conditions and procedures

Stream	Harmonised master's degree	Bachelor's degrees giving access to the master's degree	Classification according to the compatibility of the degree	Coefficient allocated to the degree
Renewable energies	Renewable energies in electrical engineering	Electrical engineering	**1**	**1.00**
		Electromechanics	**2**	**0.80**
		Industrial maintenance	**2**	**0.80**
		Automation	**2**	**0.80**
		Electronics	**2**	**0.80**
		Other licences in the ST field	**4**	**0.65**

4*Basic training modules: The fundamental modules included in the program

S1:

Electrical power transmission and distribution networks

Advanced power electronics

µ-processors and µ-controllers

Advanced electrical machines

Applied numerical methods and optimization

5*Advanced modules: Specialized or in-depth modules

S2

Photovoltaic energy conversion systems

Wind energy conversion systems

Electric power quality

Renewable energy sources

S3

Applications and sizing of renewable energy systems

Energy storage and fuel cells

Control of renewable energy systems

Renewable energy multi-source systems

Grid integration of renewable energies

6* Training costs: The costs associated with the training and any additional costs

2000Euro

7* Language of instruction: The language in which the training is given

Arabic, French and English

8* Training caneva: The plan or visual structure of the program

Semester 1 Master : Renewable Energies in Electrical Engineering

Teaching Units	Materials	Credits	Coefficient	Number of hours per week			Semester Hours (15 weeks)	Complementary work in Consultancy (15 weeks)	Assessment method	
	Title			**Courses**	**TW**	**PW**			**Continuous control**	**Exam**
Fundamental teaching unit Code : FTU 1.1.1 Credits : 10 Coefficients : 5	Electrical power transmission and distribution networks	4	2	1h30	1h30		45h00	55h00	40%	60%
	Advanced power electronics	4	2	1h30	1h30		45h00	55h00		
	µ-processors and µ-controllers	2	1	1h30			22h30	27h30		100%
Fundamental teaching unit Code : FTU 1.1.2 Crédits : 8 Coefficients : 4	Advanced electrical machines	4	2	1h30	1h30		45h00	55h00	40%	60%
	Applied numerical methods and optimization	4	2	1h30	1h30		45h00	55h00	40%	60%
Methotology U Code : MU 1.1 Credits : 9 Coefficients : 5	PW : µ-processors and µ-controllers	1	1			1h00	15h00	10h00	100%	
	PW : - Electrical power transmission and distribution networks	2	1			1h30	22h30	27h30	100%	
	PW : - Advanced power electronics	2	1			1h30	22h30	27h30	100%	
	PW : Applied numerical methods and optimization	2	1			1h30	22h30	27h30	100%	
	PW : - Advanced electrical machines	2	1			1h30	22h30	27h30	100%	
Discovery Unit Code : DU 1.1 Credits : 2 Coefficients : 2	*Choice of basket*	2	2	1h30	1h30		45h00	5h00	40%	60%
Transversal Unit Code : TU1.1 Credits : 1 Coefficients : 1	Technical English and terminology	1	1	1h30			22h30	02h30		100%
Semester 1 Total		**30**	**17**	**10h30**	**7h30**	**7h00**	**375h00**	**375h00**		

Semester 2 Master : Renewable Energies in Electrical Engineering

Teaching Units	Materials	Credits	Coefficient	Number of hours per week			Semester Hours (15 weeks)	Complementary work in Consultancy (15 weeks)	Assessment method	
	Title			**Courses**	**TW**	**PW**			**Continuous control**	**Examen**
Fundamental teaching unit Code : FTU 1.2.1 Crédits : 10 Coefficients : 5	Photovoltaic energy conversion systems	4	2	1h30	1h30		67h30	82h30	40%	60%
	Wind energy conversion systems	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental teaching unit Code : FTU 1.2.2 Credits : 8 Coefficients : 4	Electric power quality	4	2	1h30	1h30		45h00	55h00	40%	60%
	Renewable energy sources	6	3	3h00	1h30		45h00	55h00	40%	60%
Methotology U Code : MU 1.2 Crédits : 9 Coefficients : 5	PW -Wind energy conversion systems	2	1			1h30	22h30	27h30	100%	
	PW- Gisements énergétiques renouvelables	1	1			1h00				
	PW- Photovoltaic energy conversion systems	2	1			1h30	22h30	27h30	100%	
	Solar thermal energy	4	2	1h30	1h30		60h00	65h00	40%	60%
Discovery Unit Code : DU 1.2 Crédits : 2 Coefficients : 2	*Choice of basket*	1	1	1h30			22h30	02h30		100%
	Choice of basket	1	1	1h30			22h30	02h30		100%
Transversal Unit Code : TU 1.2 Crédits : 1 Coefficients : 1	Ethics, professional conduct and intellectual property	1	1	1h30			22h30	02h30		100%
Semester 2 Total		**30**	**17**	**13h30**	**7h30**	**4h00**	**375h00**	**375h00**		

Semestre 3 Master : Energies Renouvelables en Electrotechnique

Teaching Units	Materials	Credits	Coefficient	Number of hours per week			Semester Hours (15 weeks)	Complementary work in Consultancy (15 weeks)	Assessment method	
	Title			**Courses**	**TW**	**PW**			**Continuous control**	**Examen**
Fundamental teaching unit Code : FTU 2.1.1 Credits : 10 Coefficients : 5	Applications and sizing of renewable energy systems	4	2	1h30	1h30		45h00	55h00	40%	60%
	Energy storage and fuel cells	2	1	1h30			22h30	27h30		100%
	Control of renewable energy systems	4	2	1h30	1h30		45h00	55h00	40%	60%
Fundamental teaching unit Code : FTU 2.1.2 Credits : 8 Coefficients : 4	Renewable energy multi-source systems	4	2	1h30	1h30		45h00	55h00	40%	60%
	Grid integration of renewable energies	4	2	1h30	1h30		45h00	55h00	40%	60%
Methotology U Code : MU 2.1 Credits : 9 Coefficients : 5	PW Applications and sizing of renewable energy systems	2	1			1h30	22h30	27h30	100%	
	PW Energy storage	1	1			1h00	15h00	10h00	100%	
	PW Control of renewable energy systems	2	1			1h30	22h30	27h30	100%	
	Maintenance and reliability of renewable energy systems	4	2	1h30		1h30	45h00	55h00	40%	60%
Discovery Unit Code : DU 2.1 Credits : 2 Coefficients : 2	*Choice of basket*	1	1	1h30			22h30	02h30		100%
	Choice of basket	1	1	1h30			22h30	02h30		100%
Transversal Unit Code : TU 2.1 Credits : 1 Coefficients : 1	Documentary research and brief design	1	1	1h30			22h30	02h30		100%
Semester 3 Total		**30**	**17**	**12h00**	**7h30**	**5h30**	**375h00**	**375h00**		