

# Short Syllabus

# RENEWABLE ENERGY ENGINEERING

LORRAINE  
**INP** Ensem

ÉCOLE D'INGÉNIEURS CRÉÉE EN 1900

Fall Semester (September to December) or Spring Semester (January to May)



# PROGRAM DESCRIPTION

The program in renewable energy engineering at ENSEM is aimed at making students acquire scientific and technical knowledge on various forms of renewable energy (wind, solar, hydrogen, hydropower)

It enables to acquire advanced knowledge in renewable energies, electrical and mechanical energy storage, control, smart and micro energy grids, forecasting and optimization of energy systems.

The training is very hands-on and students have access to specialized equipment: fuel cells, solar panels, wind turbines, hydropower turbines, grid converters for photovoltaic and wind power systems, multiphase electric machines, micro-grid integrated into our campus, or IoT simulator and sensor platforms (LoRa).

# Renewable Energy Engineering

Course reference	Course name
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	EU Sources and Storage
	Introduction to Hydrogen and Fuel Cell Technologies
	Storage Components (Electric Storage and Generation)
	Solar Photovoltaic Design and Installation

	EU Power to the Grid
	Hydraulic and Wind Power
	Power Generation System connected to the grid

	EU Smart Grids - Micro Grids
	Electric Power Quality
	Energy Management and Microgrids
	Smart Grid Modelling and Co-Simulation

	EU Optimization
	Optimal Design of a Local Energy Network
	Optimization of a Heat Network
	Control and Optimization of Energy Systems

	EU Language, Communication and Culture
	French Language and Culture
	Cross-Cultural Communication
	Energy Economics : Issues Related to Renewable Energies

Lectures	Lab work	Student workload	Hours	ECTS	Pass Grade	More info
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12	12	24	<b>48</b>	<b>6</b>	10	
6	2	8	<b>16</b>			
4	4	8	<b>16</b>			

10	8	20	<b>38</b>	<b>6</b>	10	
12	10	20	<b>42</b>			

6	8	12	<b>26</b>	<b>6</b>	10	
8	8	12	<b>28</b>			
6	9	11	<b>26</b>			

2	6	6	<b>14</b>	<b>6</b>	10	
10	8	18	<b>36</b>			
8	6	14	<b>28</b>			

18	0	18	<b>36</b>	<b>6</b>	10	
5	0	5	<b>10</b>			
17	0	17	<b>34</b>			

<b>TOTAL</b>	<b>400</b>	<b>30</b>
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# LORRAINE INP Ensem

GRADUATE SCHOOL OF ENGINEERING SINCE 1900



École Nationale Supérieure  
d'Électricité et de Mécanique



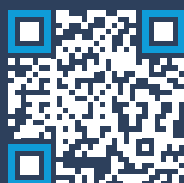
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