LA ROCHELLE, France

+ A beautiful thousand years old city with a mild and very sunny climate

A GREAT PLACE TO STUDY!

La Rochelle Université

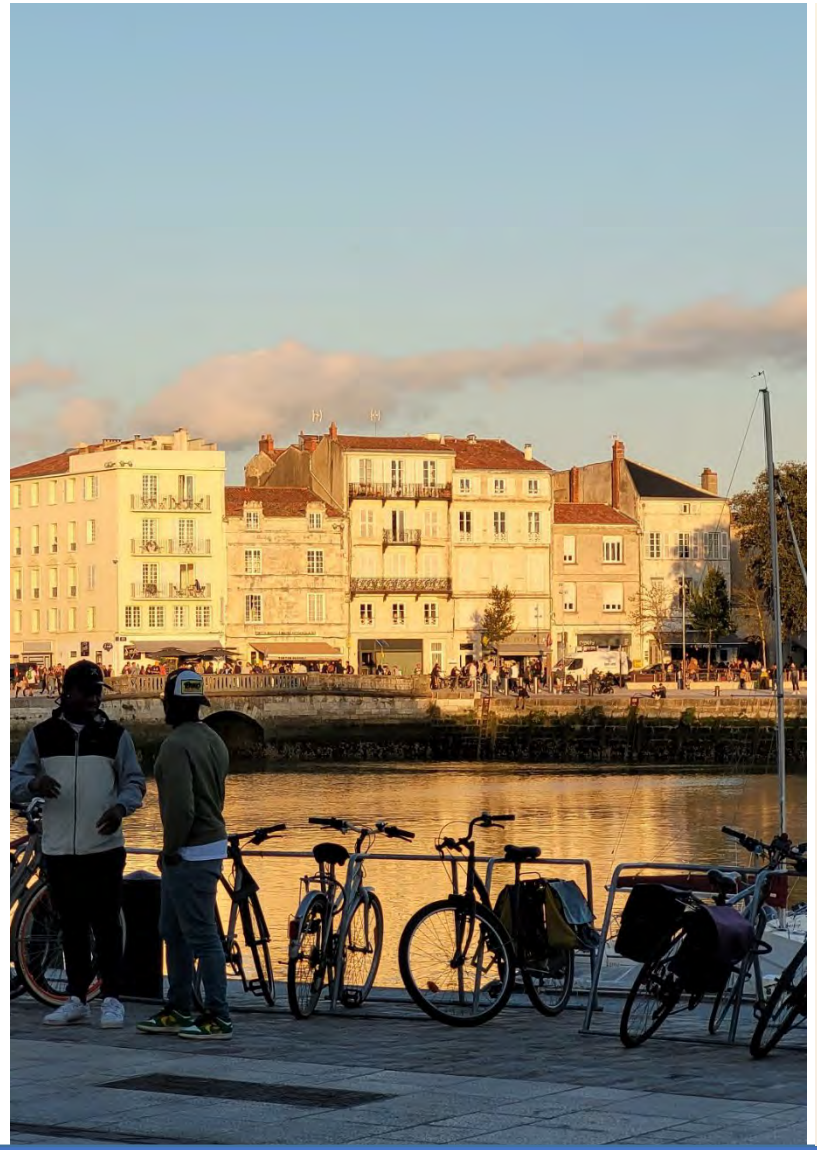
Photo : Thierry Guyot

La Rochelle Université

La Rochelle

2.5 hours from Paris by TGV

Near the beautiful Ré island



La Rochelle

A city of art and history which offers many cultural events (Francofolies, film festivals, boat show…).
A city known for its quality of life.

La Rochelle University

Photo : Thierry Guyot

A young and friendly university

8820 students
+80 diplomas offered

10 research laboratories
1 doctoral school

A campus in the city, near the old harbour

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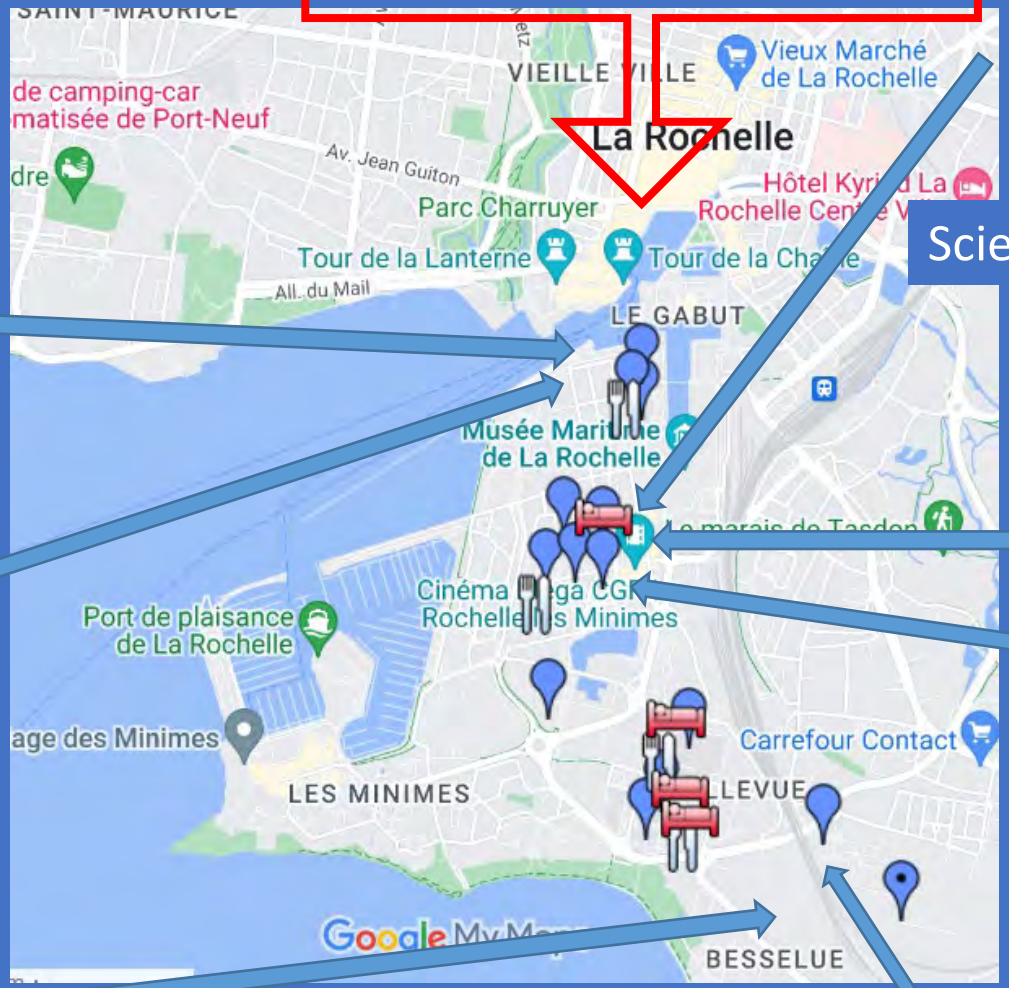
University Library

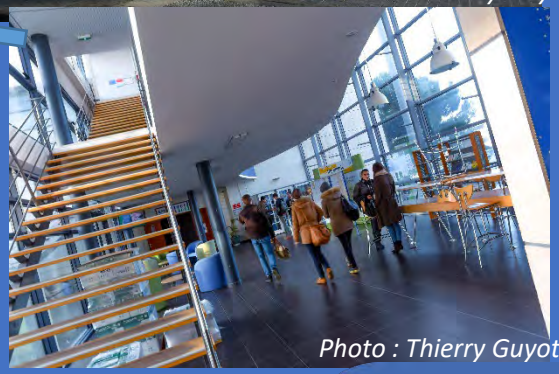
Student house
Cultural activities

Sport : 40 activities



Science and Engineering Institute

Photo : Thierry Guyot



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Law and management Institute

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La Rochelle Université

For Master's students in Engineering: courses in Materials for Renewable Energies

Full Autumn Semester with courses taught in English, at the graduate Level, in the field of Materials for Renewable Energies:

- Numerical methods in materials engineering (6 ECTS)
- Renewable energies-thermal (6 ECTS)
- Renewable energies-chemical and electrochemical (6 ECTS)
- Energy storage (5 ECTS)
- Case study (3 ECTS)

This can be completed with:

6 ECTS French Language (level A2, B1, B2 or C1)

6 ECTS Research methodology and data analysis (Code 222-1-02)

Required knowledge:

Basic knowledge of physics, chemistry and mathematics

For Master's students in Engineering: courses in Materials for Renewable Energies

Syllabus:

- **Numerical methods in materials engineering (6 ECTS)–** Code 256-1-71

  Lecture (15 hours), tutorials (12 hours), computer session (12 hours).

  Content:

Learning Outcome 1: Generate a relevant mesh to extract a physical property from a material
Learning Outcome 2: Create and design a piece in CAD/CAM and validate it using a 3D printer
Learning Outcome 3: Establish a critical approach between modeling and experimental methods using simple examples
This course provides basic concepts in finite element modeling of simple and complex metallic structures. It also teaches how to read and produce simple technical drawings. Implementing the SolidWorks software, students will model moderately complex pieces in 3D. Upon completion of this course, students will be able to:
-Solve a simple problem manually with the application of boundary conditions
-Draw a moderately complex part in COMSOL Multiphysics software
-Choose a mesh and refine it in critical regions. Apply boundary conditions and verify the results
-Implement a 3D design and modeling approach for pieces using SolidWorks software

Renewable energies-thermal (6 ECTS) – Code 256-3-41

Lecture (18 hours), tutorials (18 hours), practical work (12 hours).

Content:

Learning Outcome: Identify optimal materials, their degradation and protective systems in thermally sourced renewable energies
This course contributes to the understanding of thermal-sourced renewable energy systems (biomass and waste valorization, solar thermal, ultrasupercritical turbines, and Ocean Thermal Energy Conversion - OTEC), the materials used currently and in the future, and their degradation and protection conditions.

For Master's students in Engineering: courses in Materials for Renewable Energies

Upon completion of this course, the student will be able to:
-Understand the operating principles of thermally sourced renewable energies (biomass, waste valorisation, solar thermal, ultrasupercritical turbines, and Ocean Thermal Energy Conversion - OTEC)
-Know the existing and future materials and coatings
-Comprehend the causes of their degradation
-Determine their lifespan
-Anticipate protective solutions
-Apply these properties to the case of materials for biomass, waste valorisation, solar thermal, advanced turbines, and OTEC

- **Renewable energies-chemical and electrochemical (6 ECTS) –** Code 256-3-61
  Lecture (21 hours), tutorials (15 hours), practical work (12 hours).
  Content:

Learning Outcome: Identify optimal materials, their degradation and protective systems in chemically and electrochemically sourced renewable energies
This course contributes to understanding electrochemical renewable energy systems (fuel cells, electrolysers), to familiarising the student with the materials used today and in the future (how they degrade and how they can be protected). Upon completion of this course, the student will be able to:
-understand the operating principles of electrochemically sourced renewable energies (fuel cells, electrolysers)
-know the current and future materials and coatings
-comprehend the causes of their degradation
-determine their lifespan
-anticipate protective solutions
-apply these properties to the case of materials for fuel cells and electrolyser

For Master's students in Engineering: courses in Materials for Renewable Energies

- **Energy storage (5 ECTS) –** Code 256-3-51
  Lecture (18 hours), tutorials (12 hours), practical work (12 hours).
  Content:

Learning Outcome: Identify optimal materials, their degradation, and protective systems in energy storage systems.
This course contributes to understanding energy storage systems (batteries, flywheels, hydrogen, thermal storage, thermochemical, hydraulic, and compressed air storage), phase transformation materials, materials used today and in the future, how they degrade, and means of protecting them. Upon completion of this course, the student will be able to:
-recognise different types of batteries (Ni-MH, Li-ion, alternatives to Li)
-comprehend flywheels, grasp hydrogen generation and storage
-comprehend thermal and thermochemical storage, hydraulic storage (Pumped Storage Hydropower - STEP) and compressed air storage
-understand phase change materials, to be familiar with current and future materials and coatings, comprehend the causes of their degradation, determine their lifespan and anticipate protective solutions.

- **Case study (3 ECTS) –** Code 256-3-81
  Practical work (18 hours).
  Content:

Learning Outcome: Define an experimental protocol to address the analysis of a clean energy expertise
This course puts students in a project management situation related to a material degradation issue: expertise, failure analysis, process optimization. Upon completion of this course, students will be able to:
-identify objectives and propose a suitable approach
-conduct an experimental study in compliance with health and safety rules
-analyse, interpret, and evaluate experimental results
-synthesise work, communicate and provide a cost estimate for the study

For Master's students in Engineering: courses in Materials for Renewable Energies

Autumn or Spring semester

in the field of **Materials for Renewable Energies:**

- It is also possible to apply for an internship in the following laboratory of La Rochelle University for a few weeks to a few months:

- Laboratory of Engineering Sciences for the Environment (LaSiE)

La Rochelle Université

FOR EXCHANGE STUDENTS

- ESN Erasmus Student Network: office in La Rochelle
- University accommodation offer
- Buddy scheme
- Free student “pass culture”
- And an international office to help you

Photo : Thierry Guyot

LEARNING FRENCH

Free access to 6 ECTS credits per semester in French language for exchange students

Photo : Clément Mauduit

La Rochelle Université

Welcome to La Rochelle University !

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