

Electric Generators



Component
École Nationale
Supérieure
d'Électrotechnique
d'Électronique

In brief

- **Ametys Code:** N9EE28E
- **Open to exchange students:** Yes

Presentation

Objectives

The aim of the 'Electric Generator' design office is to enable students to design and develop an innovative electromechanical system using an exercise bike as an electricity generator.

Description

Students will learn how to size and integrate the necessary components, such as alternators, rectifier circuits and energy storage systems, in order to produce electrical power from the mechanical movement of the bicycle. The focus will be on optimising the energy efficiency of the generator, managing the energy produced and adapting the control systems to ensure maximum efficiency. Students will also address the mechanical and ergonomic aspects of adapting the exercise bike, while taking into account practical constraints such as durability and safety. Finally, through prototyping and testing phases, they will apply their technical skills to create a functional generator suitable for practical applications such as recharging electronic devices.

Pre-requisites

- Modelling of machines seen from terminals
- Analytical modelling of machines
- Numerical modelling of machines seen from terminals
- Optimisation methods

- CAD
- Basic static conversion circuit