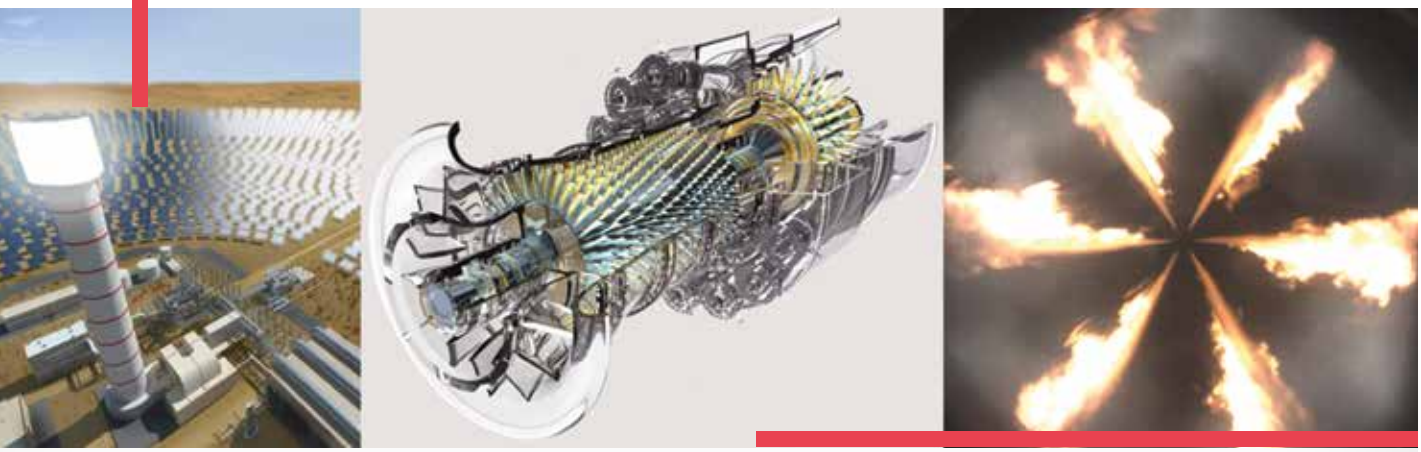
REINVENT ENGINEERING

CENTRALE NANTES



graduate programme | Ingénieur grande école

2ND AND 3RD YEAR SPECIALISATION

ENERGY PRODUCTION AND MANAGEMENT

Improvements in energy efficiency, the development of renewable energies and energy storage are amongst the main challenges facing engineers today. It is within this context that this specialisation aims to provide general engineering students with the skills to deal with cross- and multi-disciplinary issues linked to energy. The following fields are covered:

- conventional energy production
- renewable energy production (wind, solar and thermal power...)
- energy management, transport and storage
- efficient use of energy particularly in industry and construction
- consideration of the environmental constraints linked to energy (depollution of energy production systems).

COURSE CONTENT

- Combustion for energetic processes
- Thermodynamics of engines
- Applied thermodynamics for energetic processes
- Turbomachinery
- Conventional energies
- Low carbon energies
- Solar captation
- Transport - storage - conversion - energy management
- Project 1
- Carbon balance and energy auditing
- Heating and air conditioning systems
- Thermal performance of buildings
- Practical work
- Project 2
- Internship

La cogénération

SECTORS OF ACTIVITY & EMPLOYMENT PROSPECTS

A wealth of employment prospects exist across industry:

> Traditional energy production sector (EDF, Areva, GDF Suez, TOTAL, ALSTOM, ENI, E.ON)
> Renewable energy production sector (Areva Solar, Naval Group, ALSTOM, SIEMENS, GE Wind Energy, Gamesa, REPower, Enercon,...)
> Energy transport sector (RTE, Direct Energie, GrDF, ENI)
> HVAC sector (Saunier Duval, GEA, Daikin, A2P,...),
> Energy-consuming industries aiming to reduce their energy bill (SNCF, Saint Gobain, ArcelorMittal, Air Liquide, ...)
> Engineering and design consultancies specialising in thermal comfort and building energy (Indiggo, Alterea, Alteréco,...)
> National and international bodies promoting the development of renewable energies, and energy research centres (CEA, IFPEN)

TEACHING STAFF

HEAD OF SPECIALISATION:

Jean-François Hétet

CENTRALE NANTES LECTURERS:

David Chalet, Pascal Chessé,
Jean-François Hétet, Thierry Jaszay,
Alain Maiboom, Vincent Berthome, Xavier Tauzia

EXTERNAL SPEAKERS:

EDF, Cohérence énergies, Valéo, IFPEN, RTE, ENGIE, GRT Gaz, CEREMA, INDIGGO, Saunier Duval EM2C, LHEEA, IMN

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EXAMPLES OF PAST PROJECTS

> Design, production and testing of a thermal solar collector
> Study on inter-seasonal heat storage
> Study on concentrated solar power
> Integration of forecasted weather data into the energy control system of the Solar Decathlon prototype
> Thermal study of housing (steady-state calculation and dynamic thermal simulation)
> Study of a cogeneration system and combined cycles
> Study of an ocean thermal energy system

EXAMPLES OF PAST INTERNSHIPS

> Assistant Solar Project Manager (JP Energie Environnement)
> Consultant in Carbon and Energy Transition Strategy (Carbone 4)
> Heating and air-conditioning installation study and works
> Energy optimization for a rotary kiln: experimental development of an innovative heat exchanger (IFSTTAR)
> Study and improvement of tomorrow's power grid (RTE)
> Integration of wind turbines into the electricity market (Maïa Eolis)

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