

## Entrance requirements

Students with outstanding achievement equivalent to UK First Class in the following fields can apply to this programme:

- › mechanical engineering
- › automotive engineering
- › electronics
- › computer science
- › physics or chemical engineering
- › material engineering
- › mechatronics

## How to apply

Required documents:

- › Application form: <http://www.isat.fr/fr/International/english-taught-master> or <http://www.univ-orleans.fr/polytech/automotive-engineering-sustainable-mobility>
- › Letter of application outlining motivation to participate in the programme
- › Curriculum Vitae (Resumé)
- › Official copy of a Bachelor's degree or equivalent with transcript of records (English translation) and rank
- › Two referees and their addresses, preferably from the university or institute that awarded the first degree, who will be contacted
- › A copy of valid ID documentation and passport
- › A copy of score report for the English level
- › GRE

to be sent to: [master.aesm.polytech@univ-orleans.fr](mailto:master.aesm.polytech@univ-orleans.fr)

## For further information

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<http://www.isat.fr>

## Overview

**Duration:** Four semesters

**Credit Transfer:** Each semester accounts for 30 European Credit Transfer and Accumulation System (ECTS) credits. ECTS credits are transferable.

**Number of places:** 20

**Tuition fees:** 11,500€ (5,750€ x 2 years) subject to change according to Board policy

**Grants:** The Conseil Régional de Bourgogne and the Conseil Régional de la Région Centre may offer grants depending on AESM S1 results.

# AUTOMOTIVE ENGINEERING for SUSTAINABLE MOBILITY

Master Programme taught in English

- ▶ Energy Management & Control for Sustainable Mobility
- ▶ Vehicle Dynamics / Intelligent Vehicle

# Automotive Engineering for Sustainable Mobility

## A new idea

Keeping the planet turning in the right direction will take a lot of brand new technical and creative know-how from engineers today. To respond to this imperative, Polytech Orléans and ISAT have combined their expertise and their facilities in the automotive field to offer a very specialized programme.

The new Master in Automotive Engineering and Sustainable Mobility, taught entirely in English, is tailored to address this need and encompasses the entire dimension of today's and tomorrow's complex automotive systems in a **real-life context**.

The revolution in research tools in mechanics, materials, energy and electronics allows our students to study total product performance — that means **real-world experience** closely aligned with industrial concerns.

This Master programme integrates creativity, technology and labs with three semesters of study followed by one semester of individual research thesis.

## Takes you on to

Our graduates will be expert in the latest and most promising new technologies like alternative fuels, ecodesign, biocomposites and sustainable manufacturing as well as all aspects of mechanics, energy and embedded electronics. They will also benefit from a sharp focus on research and be able to:

- > prepare a career as an engineer for industrial projects and services,
- > qualify to be a research and development engineer for leading companies and organizations, and
- > acquire a valuable background for PhD studies.

## Course description

Core teaching units and specialized teaching units for  
Option Energy Management & Control for Sustainable Mobility (EMC)  
and  
Option Vehicle Dynamics / Intelligent Vehicle (VD/IV)

YEAR 1	<p><b>Fall semester in Orléans (30 ECTS)</b></p> <ul style="list-style-type: none"> <li>▪ Internal combustion engines (EMC) / Vehicle dynamics (VD/IV)</li> <li>▪ Trends in Automotive and Transportation: Past and present transportation economy for the future</li> <li>▪ Scientific prerequisite</li> <li>▪ Electrical engineering</li> <li>▪ IT: Programming</li> <li>▪ Advanced physics</li> <li>▪ French culture and language</li> </ul>
	<p><b>Spring semester in Orléans (30 ECTS)</b></p> <ul style="list-style-type: none"> <li>▪ Control and on-board diagnostics applied to internal combustion engines (EMC) / vehicle dynamics (VD/IV)</li> <li>▪ Acquisition systems and signal processing</li> <li>▪ Real-time programming</li> <li>▪ Simulation and experiments on powertrains</li> <li>▪ Project</li> </ul>
YEAR 2	<p><b>Fall semester in Nevers (30 ECTS)</b></p> <ul style="list-style-type: none"> <li>▪ Engine components (injection, turbomachinery) (EMC) / Vehicle dynamics (VD/IV)</li> <li>▪ Alternative fuels and pollutant reduction (EMC) / Intelligent vehicle (VD/IV)</li> <li>▪ Critical systems and vehicular networks</li> <li>▪ Alternative fuels and pollutant reduction</li> <li>▪ Energy hybridation / storage</li> <li>▪ Electrical powertrain</li> <li>▪ Professional conferences</li> <li>▪ French culture and language</li> <li>▪ Project</li> </ul>
	<p><b>Spring semester (30 ECTS)</b></p> <ul style="list-style-type: none"> <li>▪ Internship in a research center or laboratory</li> </ul>



Institut Supérieur de l'Automobile et des Transports

ISAT, located in Nevers (2 hours south of Paris and close to the famous Nevers/Magny Cours F1 circuit) is the only French state-run institution covering the whole range of positions and skills related to the automotive and transport industries, with a strong engineering expertise in mechanical and electrical engineering and energy engineering from design to production and R&D and design:

- > research design and development,
- > industrialization,
- > manufacturing,
- > quality, purchasing, embedded electronics...

ISAT network includes:

- > 650 students
- > approximately 100 tenured teachers, researchers and industry professionals
- > technology transfer laboratory "SATT Grand Est" located in Magny-Cours
- > DRIVE laboratory, research department in vehicle engineering for the environment
- > public/private research laboratory Id-Motion — development of high-efficiency energy powertrains & research of sustainable mobility solutions

ISAT belongs to the University of Bourgogne part of the top 600 of the Times Higher Education 2015 world ranking. ISAT is part of the Polytechnicum de Bourgogne/Franche Comté network together with 11 other engineering and business-oriented Grandes Ecoles.

With the Formula 1 circuit "Magny-Cours" nearby, our students are able to experience leading automotive technology first-hand, which serves an educational purpose as well as a recreational one.



Ecole Polytechnique de l'Université d'Orléans

The public Engineering School of the University of Orléans offers seven specialities:

- > Energy engineering (TEAM)
- > Mechanical engineering (ICM)
- > Ecotechnology engineering in electronics and optics
- > Civil engineering
- > Production
- > Smart building
- > Industrial engineering applied to cosmetics, pharmacy and the food processing industry

Polytech Orléans has acknowledged expertise in driving control, embedded systems, internal combustion engines and external aerodynamics.

A member of the Polytech network of 13 engineering schools in France, Polytech Orléans includes:

- > 1100 engineering students,
- > 60 PhD students, 100 senior tenured staff in teaching and research, more than 100 industrial lecturers
- > and is associated with six well-known research laboratories.

During their project work, students will benefit from high-level experiments including:

- > static and dynamic automotive test benches
- > subsonic wind tunnels
- > prototype cars including hybrids
- > electrical engineering lab
- > driving simulator

The University of Orléans is a multidisciplinary institution which was created in 1306 and reopened in 1961, celebrating its 700th anniversary in 2006.

Orléans, capital of the "Region Centre", is located one hour from Paris in the Loire Valley, which is featured on the UNESCO heritage list.

