Inventing the comfort of the future
OPEN-MINDED AND AUTONOMOUS ENGINEERS, MANAGERS, AND EXPERTS.

OVERVIEW

• Masters’ degree in Engineering, accredited by the French Accreditation Board for Engineering Education (CTI)
• 3-year course running from 3rd to 5th year of higher education
• EUR-ACE European quality label
• The school is part of the Université du Maine and benefits from all its facilities
• Underpinned by internationally recognized research laboratories in acoustics, optics, micro-technologies, IT, chemistry, physics, etc.
• Total enrolment fees (including social security contributions): in 2015, €830.10 standard, €50 for recipients of a French State grant.

A FEW FIGURES

• Founded in 1995
• Over 850 qualified engineers
• 45 to 100 students per year
• 30 permanent staff
• Over 80 supernumerary staff from industry
• 18 administrative and technical staff
• 12 rooms for practicals
• 1 cleanroom
• 1 testing hall
ENSIM is an engineering school, and a member of the Archimède Group and the French Engineering School Conference of Directors (CDEFI).

It recruits students having successfully completed their first two years of higher education with a grounding in scientific culture and an open-minded approach to their environment.

The training is based on the quality of support and assistance provided by recognized research-active staff.

ENSIM is a centre for student life. It seeks to establish a genuine, close-knit year-group, with social relations being further enhanced by people's diverse backgrounds and international origins.

Business partnerships (sponsors, work placements, and projects) enable students to start their professional career.

Active alumni support facilitates the employment of recent graduates.

ENSIM offers two specialisations, each with two options:

VIBRATIONS, ACOUSTICS, SENSORS
- Vibrations, Acoustics (VA) to improve vibratory and acoustic comfort.
- Micro-Systems and Optical Metrology (MCMO) to devise intelligent measuring systems.

COMPUTER SCIENCE
- Real-Time and Embedded Systems Architecture (ASTRE) to develop embedded software and smart devices.
- Person-System Interaction (IPS) to invent tomorrow’s digital society.

Aurélien MELOU
Engineering Project Manager, 27 years old, 2006 graduate

I went to ENSIM in 2003 after having done a two-year technology diploma in Lannion.

I was looking to move into a professional role combining project management with cutting-edge technology.

In addition to covering all the theory, ENSIM also provides very strong links to the professional world via its projects and work placements. The school thus enables trainee engineers to discover industrial constraints at an early stage.

The range of projects available at ENSIM means students can get involved in missions similar to those they will carry out on leaving. For example, in my second year I was able to manage the project development team taking part in the French robotics championship, a subject combining mechanics, electronics, and electricity, and obliging the students to organize themselves to work for a common goal with budgetary, time, and technical constraints. My third-year engineering work placement happened quite naturally and I found myself working in the industrial projects unit of a group specialising in the design, manufacture, and distribution of agricultural material, and it led to my appointment there in project management.

The diversity of the syllabus at ENSIM equips you with both in-depth and wide-ranging knowledge, enabling you to easily fit into a job where you need to have a complete vision of a complex and multi-technological product.
Improving vibratory and acoustic comfort

“Good vibrations are music, bad vibrations are a source of inconvenience and discomfort.” The car industry, aerospace industry, architecture, and transport are all natural research fields for improving acoustic quality.

Syllabus

The syllabus at ENSIM is designed to deliver scientific expertise enabling students to master all the stages in the design process for acoustic and vibratory engineering. The main tools used in acoustics and vibration engineering are acoustic, vibratory, and vibro-acoustic metrology, digital modelling and simulation, data calibration, identification of signatures, diagnostics and decision-making, adjustment of active and passive control elements, and assessment and non-destructive testing (NDT).

Training in the VA option is based on the thirty years of experience of the Université du Maine’s Acoustics Laboratory, LAUM (French accreditation number CNRS 6613), the largest European laboratory in its field.

Overview

Acoustics is the science of sound. The task of an acoustic engineer is to analyse, control, and reduce sound and vibration pollution, thus helping improve the quality of life. ENSIM’s Vibrations/Acoustics course is for all scientists, be they musicians or not, who are passionately interested in sound and vibration phenomena. The close links between science and music are often used as a lever for introducing useful notions for engineers.

Careers

ENSIM VA graduates work in design, research and development, specialised consultancies, SMEs and major groups, as well as in research laboratories. Either working on their own or as part of a team, they supervise and set up innovative approaches and solutions to control sonic and vibratory fields. The disciplinary fields covered include automobile, aerospace, and railway acoustics, environmental acoustics, room acoustics, and musical acoustics.

Specialisation

Vibrations, Acoustics, Sensors

Option

Vibrations, Acoustics
Devising intelligent measuring systems

Micro-Systems and Optical Metrology

In a period of miniaturisation and of technological challenges relating to the environment and sustainable development, information gathering and conditioning and decision-making are key issues for new technologies.

OVERVIEW
The MCMO option trains engineers with versatile skills in instrumentation, sensors, and measurement, specialising in micro-systems, acoustic micro-sensors, and acoustic, optical, and thermal sensors, providing them with the optical metrology tools required to characterise them. It provides skills for all those involved in the measuring process, from the physical process of information gathering, conditioning, and processing, through to decision-making.

SYLLABUS
The MCMO option is ideally suited to students passionate about advanced technology who are drawn to the world of the infinitely small and fascinated by the magical aspects of light and lasers. Students who are enthusiastic about the idea of making micro-systems will derive satisfaction from the ENSIM syllabus, as will those who wish to find out about the use of photonic techniques for non-intrusive systems analysis. Everyone will be able to apprehend the behaviour of these devices via innovative technologies.

CAREERS
MCMO general engineers work in design, engineering, and research and development, as well as consultancy and manufacture, in all cutting-edge fields where sensors are essential for information gathering, such as the aerospace, automobile, and medical instrumentation industries, environment and sustainable development, industrial production, and process development and monitoring.

SPECIALISATION
Vibrations, Acoustics, Sensors

OPTION
Micro-Systems and Optical Metrology
Developing embedded software and smart devices

SPECIALISATION
Computer Science

OPTION
Real-Time and Embedded Systems Architecture

OVERVIEW
Fields using electronic systems such as transport (planes, trains, and automobiles), home automation (smart houses), and industry, require extensive development of smart devices, embedded systems and software in networks, smart cards, and mobile telephones and data terminals. Equally, real-time systems are increasingly widespread in the control of ever more complex industrial systems. The ASTRE option develops cutting-edge skills to enable graduates to drive innovation in ever-changing real-time and embedded systems.

SYLLABUS
The ASTRE option trains versatile engineers with industrial IT skills, with a slant towards digital electronics, in embedded and/or real-time systems, signal processing, and network and mobile transmission networks.

ASTRE provides students with skills in the design and implementation of complex IT systems requiring the ability to simultaneously master networks, hardware architecture, and software architecture. Constraints in the fields relate to miniaturisation, reducing energy consumption, and managing the required level of flexibility.

CAREERS
ASTRE engineers work in a large number of fields such as industry (manufacture, imaging, robotics, etc.), transport (automobile, aerospace, and trains), multimedia (telecommunications, digital television, etc.), communication networks, and home automation.

These fields draw on skills in system design, engineering, research and development, consultancy, studies, and testing.

Real-Time and Embedded Systems Architecture

The new era launched by the rapid emergence of embedded electronic systems has led to the creation of autonomous devices with a high level of interaction with users.
Person-System Interaction

IT is all around us in our ever-changing digital society. One of the challenges is to design easy-to-use, context-aware software.

Overview

Communication and IT are at the heart of our digital society. IT system design involves adapting software to user context. This necessitates a user-centred approach taking into account societal aspects and the evolution of IT systems. IPS training is intended for students who are mindful of this challenge, and both passionately interested in technological innovation and open to cross-disciplinary and multi-disciplinary approaches.

Syllabus

The IPS option trains versatile IT engineers able to manage missions in analysis, design, development, and testing, involving technological, human, and social aspects. IPS provides students with skills in IT engineering, information systems, human-computer interaction, semiotics, multimodal interaction, mobility, security, artificial intelligence, auditing, and engineering consultancy.

Careers

IPS engineers work in managerial roles in development, as IT project managers, software architects, and project management assistants, and in change management and consultancy. Economic sectors include banking and insurance, transport, mobile telephony, distribution, agriculture and the environment, web and internet, multimedia, business services, and training programmes.
PROGRESSION
The first three semesters (1st year and first half of the 2nd year) provide students with grounding in elements specific to engineering culture, enable them to acquire core scientific skills, as well as starting to prepare them for their subsequent specialisation. Engineering students encounter the world of work during a four- to ten-week placement as a worker or technician.

The next two semesters provide students with the specific technical knowledge for their chosen option. Students also perfect skills specific to engineering (management, quality, managing innovation, company culture, projects). During this part of their studies students may go on an industrial placement or else study abroad.

The last stage of study is a final six-month industrial placement enabling engineering students to familiarise themselves with the demands of their profession.

HANDS-ON PRACTICAL LEARNING
50% of supervised coursework is devoted to practicals (700 hours) and projects (300 hours). ENSIM also has an IT pool that is permanently open to students. Our teaching and industrial equipment includes thermographic cameras, a sonic reverberation measuring chamber, a wind turbine generator and generating set, a laser holography platform, a robotics project room, a controlled atmosphere micro-technology room, a language laboratory, an online learning platform, a tactile terminals room, peripherals with movement sensors, interactive whiteboards, and a humanoid robot.

ENCOURAGING TEAM WORK
For core syllabus taught modules (communication, company culture), practicals, and projects, coursework is designed to encourage students to work together.

STAFF-STUDENT RATIOS
The school is committed to ensuring students receive the correct supervision, with appropriate class sizes for taught classes (24 maximum) and practicals (12 maximum).

More flexible teaching and tutoring is available for specific purposes.

From the beginning of their studies, students receive continuous support.

PROMOTING STUDENT INITIATIVES
It is important for students to get involved in extra-curricular activities and find their place in the social life at the school. These social life and interaction projects are set up on the initiative of students and create a close-knit school community. They promote relations between year-groups and specialisations, and enable students to get involved in outside activities together. They can be included within the annual assessment for the attribution of additional marks.

UNIVERSITY SERVICES
ENSIM is at the heart of the campus and students can make the most of all the shared facilities the Université du Maine has to offer, such as its university library, electronic learning systems, cultural and sporting activities, student clubs, and medical and social services.
The school draws on its extensive resources to send trainee engineers on placements and study trips abroad, and to welcome foreign students who wish to come and study at ENSIM.

Our international experience results in tangible benefits:

- **Placements**: 20% of engineering placements take place in foreign companies or research laboratories, in Japan, the USA, Canada, Brazil, Ireland, Great Britain, Spain, Germany, etc.

- **International exchanges**: ERASMUS (Denmark, the UK, Ireland, Spain, Italy, Czech Republic, Germany, Poland), BRAFITEC (Brazil), GEORGIA TECH (USA), ISEP (USA).

- **Dual diplomas**: Denmark (DTU, Copenhagen), USA (Georgia Tech, Atlanta), Canada (Montreal).

ENSIM receives and trains students from Brazil (BRAFITEC), Cameroon (Intégrer en France), Europe, Africa, and Asia. Lecturers from foreign universities contribute to the courses throughout.

**Languages**: proficiency in international English is guaranteed and students must obtain a TOEIC score of at least 785 points. They are also encouraged to study a second language (teaching available in over 10 languages).

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**CASE STUDY**

**Caroline ROMEYRON**
3rd-year student
For my 3rd year at ENSIM, I went to KTH (Royal Institute of Technology), a major Swedish engineering school in Stockholm.
It was founded in 1827 and is currently the largest Scandinavian University of Technology, with a vast campus where people of all nationalities meet and come together.

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**Michael BRENNAN**
I have been teaching a short course on the active control of sound and vibration to students in their final year of study at ENSIM since 1997. Since that time I have seen ENSIM grow and expand, so that it is now one of the best engineering schools in France specialising in acoustics and vibration. The students are highly motivated, and their skills are in demand by industries across Europe. Some students have spent some time in my own institution, the Institute of Sound and Vibration Research at the University of Southampton in the UK, where they have proved to be very capable of taking advanced courses in acoustics and vibration and in some cases taking part in research projects. ENSIM is a first-class Engineering Department, where students get a first-class Engineering degree.
ENSIM works closely and actively with people in industry and research. A series of sponsor schemes, placements, and project studies and implementations provide training for future engineers whilst remaining attentive to the skills sought by companies and research laboratories.

**PLACEMENTS**
Students carry out placements of a minimum of 28 weeks, progressing from a position as an operative (4 weeks minimum in the 1st year) to project management (final 6-month placement in the 3rd year).

**PROJECTS**
Over the 3 years, 300 hours are devoted to projects. In the 1st year these involve explaining science for non-specialists, communication, and work with associations, moving on to projects based on the needs of industry and research laboratories (in the 2nd and 3rd years) such as:
- Instrumentation for a car prototype;
- Acoustics of musical instruments;
- 3D acoustic imaging;
- Fabrication of a millimetric microphone;
- Entry for the French robotics championship;
- Quality approach in metrology;
- 3D optical measures by fringe projection;
- Monitoring of hospital patient’s walking via embedded system;
- Controlling a robot using an i-phone;
- Home automation, multimodal control system (voice, gesture) for home environment;
- Mobility, design of service application using tactile interface;
- Decision-making, study for supervision interface;
- Task assistance, fabrication of companion software.

**SPONSOR SCHEMES**
Each student is followed by an industrial sponsor who introduces them to the way their company operates. This approach builds up the industrial sponsor’s awareness of the schools teaching areas and partnership opportunities.
In addition to this, each year-group is mentored by an alumnus with a distinguished career record.

**PARTNERSHIPS**
Is a junior company that carries out work for external industrial partners. It enables students to do paid work in the school’s skill areas. jensim.univ-lemans.fr

To contact the Industrial Relations department please email: ensim-relindus@univ-lemans.fr
Research is the source of innovation.

Our engineering training is based on cutting-edge research via the involvement of all members of staff in the University’s CNRS-affiliated research teams. They work on the great challenges facing the competitiveness clusters and on French and European research projects: the vehicles of the future, complex composite materials, sensitive materials for chemical detection (polluting gases) and biological detection (prion proteins, etc.), thermo-acoustics, automatic speech and text translation, computer-aided learning environments, etc.

Students undertake projects and placements which bring them into contact with research activities thanks to the presence of several laboratories in the ENSIM buildings (vibrations and acoustics, optical measurement and control, micro-technologies, functional surfaces). This greatly encourages industry-focused scientific studies.
**Employment and business sectors**

### Status of graduates 1 year after leaving ENSIM

- **57%** Permanent position
- **16%** Temporary position
- **9%** Further study
- **7%** Doctoral, Post Doc
- **2%** Other
- **9%** Jobseeker

### Business sectors

- **14%** Manufacture of electrical and electronic equipment
- **11%** Manufacture of machines and equipment
- **11%** Manufacture of transport material
- **8%** Metallurgy and metal-working
- **5%** Energy

### Students find a career, from SMEs through to major groups (2006 data)

- **14%** Manufacture of electrical and electronic equipment
- **11%** Manufacture of machines and equipment
- **17%** Transport and communication
- **10%** Various
- **5%** Construction

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**CASE STUDY**

**Olivier PAULY**

**Manager**

2002 year-group

After a dual diploma with Georgia Institute of Technology in Atlanta, I started my career as a test engineer in the aerospace industry. Two years later, I became development manager in charge of studying and implementing innovative tests. In 2006, I was appointed commercial director of an engineering company specialising in the reliability testing of electronic equipment. In late 2006 I became the manager of this company.

My initial training at ENSIM / Georgia Tech provided me with the bases required to take on ever larger and more complex roles. What I have found most useful, beyond the course content, was the working methods, the attitude, and the broad-minded approach of the training in general engineering.

**Sandie LE CONTE**

**Research engineer**

1997 year-group

On graduating from ENSIM in 2000, I decided to do a research Masters’ with the LAUM so as to hone my skills in acoustics. This enabled me to join IFREMER (the French Research Institute for the Exploitation of the Sea) for a placement, and then go on to do a doctorate in submarine acoustics.

During my three years as a doctoral student I was able to go on oceanographic missions to collect data from various sediment sonars and sounders. I had to develop algorithms and models.

On getting my doctorate in December 2004 I came to work for the Museum of Music in early 2005 as a research engineer in physical measurement. My work consists in researching mechanical acoustic characterisation tools so as to better understand and preserve ancient musical instruments.

**Gilles GRAYON**

**Technical manager**

We got to know ENSIM in February 2009 when one of its trainee engineers, Jean-Philippe BINET, came here on a seven-month final placement. The various skills he drew upon to carry out his placement topic, “The acoustic surveillance of worksites”, enabled us to appreciate the quality of his training.

Due to an increase in workload, IMPACT ACOUSTIC consultancy based in Mesnil le Roi (78) naturally decided to employ Jean-Philippe BINET on a permanent contract in September 2009.
Recruitment

Entry routes to 1st year and 2nd year at ENSIM

- General undergraduate(1) & Grande Ecole technical candidates
- Grande Ecole humanities candidates (for Computer Science specialisation)
- Grande Ecole engineering candidates
- 2nd-year Grande Ecole engineering candidates(2)
- Faculty of Sciences and Techniques Université du Maine
- Foreign Students
- 1st-year Masters’, VPA(3)
- ENSIM application(4) and interview for pre-selected candidates
- Corresponding level + Interview
- Archimède competition
- EG@ Competition Intégrer en France (Central Africa)(5)
- Application to the Cooperation and Cultural Action Department and interview for pre-selected candidates
- ENSIM application(4) and interview for selected candidates

1st YEAR

2nd YEAR

3rd YEAR

DIPLOMA

(1) mostly in physics, mechanics, mathematics, electronics, and computer science
(2) http://sciences.univ-lemans.fr/Classe-Preparatoire-E2i
(3) VPA: Validation of Professional Achievements
(4) http://ensim.univ-lemans.fr/ensim-candidatures_inscription.html
(5) http://www.euro-graduation-access.org/

Application files may be filled out and submitted on the website: ensim.univ-lemans.fr

ENROLMENT FEES

ENSIM is a public engineering school, and mainly financed by the French State.

Enrolment fees are determined each year by ministerial decree. Enrolment fees — including Social Security contributions — are €59.57 for students in receipt of a grant from the French government, and €814.57 for other students.

HIGHER EDUCATION GRANTS

For Higher Education grant applications, and/or requests for accommodation in a hall of residence, students have to fill out a Student Support Application (a “Dossier Social Étudiant”) at the Regional Student Services Office (or “CROUS”). One application covers both.

ACCOMMODATION

The Local Regional Student Services Office (or “CLOUS”) provides nearly 1,000 student bedsits, studio flats, and 1-bedroom flats on 2 sites. The average cost is about €220 for a room, and about €300 for a studio.

CLOUS, tel. +33 (0)2 43 28 60 70 or www.crous-nantes.fr

Offers of rooms and flats to let by private landlords are put up on the notice board.
**CASE STUDY**

**Thibaut LO-PRESTI**  
2007 year-group  
President of the Bureau des Etudiants

*My experience in the BDE is very fulfilling and teaches me a lot about managing, organising, and social and human relations. The BDE plays a leading role in student life at ENSIM, and has to be well run if all those involved in the school are to get the most out of it. And that means putting in work every day, sometimes a lot of work, and it is worth doing well.*

**Bastien FRANCONY**  
2007 year-group  
President of the ENSIMELEC association

*ENSIMELEC is a club to enable ENSIM students to get involved in robotics at the school. The main aim of the association is to create a robot which is entered for the French robotics championship. Robots are a technological and human challenge, and given the range of different areas needed to build one (mechanics, electronics, IT, and so on) it is a matter of team work and camaraderie.*

**Marie ESCOUFLAIRE**  
2007 year-group  
Vice President of J’ENSIM

*During my second year I decided to join the school’s junior enterprise (J’ENSIM) as Vice President. This student association provides business services drawing on ENSIM’s expertise via missions carried out by students.***

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**ENSIM students on the go**

Student clubs are an integral part of life at ENSIM. The school’s clubs are run by students and offer varied and diverse activities after classes.

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**Student life and clubs**

The Student Union (BDE, or Bureau des étudiants) brings together a large number of activities at the school, going from sports and leisure (football, juggling, poker), to culture (music, drama, and shows), and culinary arts (cafeteria, tastings, etc.).

The BDE also organises events like the Freshers’ period and the Christmas meal. Other, more independent bodies at ENSIM complete the range of activities on offer with clubs for film lovers, photographers, and a sound lovers club even.

The GALA association brings together former and current school members, together with their family, school staff, and ENSIM partners for the graduation gala evening.

The ENSIMELEC club represents the school at the French robotics championship.
Lying at the heart of a motorway network and 54 minutes from Paris, Le Mans is the second greenest town in France, with a population of 151,000 inhabitants in the town itself and 200,000 inhabitants in the Le Mans area.

A tramway running across the town links the TGV station to the University (15 minutes from the station), sporting facilities, clinics, and hospital centre.

Le Mans is a town of history and culture and hosts numerous events including the Europa jazz festival, the Carrefours de la Pensée, Puls’Art, the Festival de l’Epau, the Nuit des Chimères, and the 25ème Heure du Livre among others.

National and international sporting events are held all year round such as the 24 Heures du Mans, the Ouest-France cross-country race, the Le Mans French Moto Grand Prix, the Le Mans 10km and semi-marathon, and the 24H Rollers event.

**A modern, pleasant city**

**A town with multiple strengths**

- **An industrial centre:** the French car industry has a strong presence in the Sarthe, with manufacturers and numerous parts suppliers of varying size: Auto Châssis International, Claas, GKN Driveline, Harman Becker International, NTN Transmissions Europe, Renault, Valéo, etc.

- **An international centre for the tertiary sector:** at the Novaxis TGV Station, MMA, ST Ericsson, GIE Sesam Vitale, and the SNCF’s Material Engineering Centre with about 250 engineers working on designing TGVs.

- **A competitiveness centre:** Le Mans has three specialised clusters, one in metallic assemblies and complex composites, one in luxury automobiles, and one in networked images. The town draws on the strengths of the University, the Technopole, the Institut de l’Automobile at the Technoparc, and the Centre for Technology Transfer, to promote research that will be used by the industry of tomorrow.

- **A centre for creativity and innovation:** Créapolis seeks to bring creativity and imagination to sound, images, forms, colours, and flavours so as to promote industry and the service sector. Since being set up the Émergence incubator has been the centre of a series of measures supporting those driving innovative projects.

- **A centre for sporting excellence:** this centre has many major facilities on a single site – the 24 Heures du Mans circuit; the Antarès basketball and events arena, the future football stadium (MMArena), the cycle track, and the golf course.