ENGINEERING COURSES TAUGHT IN ENGLISH AT INSA LYON

FOR EXCHANGE STUDENTS

2018-2020
INTRODUCTION

INSA Lyon offers a wide range of courses in Science & Technology, from undergraduate level up to PhD. High proficiency in Science and Technology combined with a humanistic lens and openness to the society and the world are key values of the INSA education model. More than 1000 students graduate every year from INSA Lyon, highly appreciated by companies worldwide.

The INSA curriculum is a 5-year program and leads to the « Diplôme d’ingénieur », equivalent to a Master of Science. It is divided into two tracks:
- Year 1 and 2: a common track for all engineering students to ensure strong fundamental knowledge
- Year 3, 4 and 5, organized in 9 engineering fields named Departments.

Exchange students are welcome to all INSA Lyon Departments. A majority of courses have to be taken in one of the 9 Departments, then additional courses can be chosen in another. One semester cannot exceed 30 ECTS credits. On average 1 ECTS credit= 20 hours of lectures in-class and personal work. Exchange students can simulate their choice of courses prior to coming to INSA Lyon on : exchange-student.insa-lyon.fr

Company internship opportunities are available following one academic semester. The internship is carried out under the supervision of a Department with international students keeping their exchange student status and visa. Each Department has its own organization and network among the numerous global companies and SMEs located in our region, ranking first for industry in France.

INSA Lyon is also a research center with more than 600 researchers working in 23 laboratories, combining education activities and close links with companies and public authorities. It promotes a cross-disciplinary approach towards 5 main societal challenges:
• Digital Society and Information
• Energy for a Sustainable Development
• Environment: Natural, Industrial, and Urban Environments
• Global Health and Bioengineering
• Transport: Structures, Infrastructures, and Mobilities

www.insa-lyon.fr/en/research

French as Foreign language

INSA Lyon has its dedicated language center. Among 10 languages, French as a Foreign language (FLE) is taught by a professional team. Summer school and semester courses are available for international students and are strongly recommended even though they choose courses taught in English.

INSA Lyon was recently qualified again with the highest rate (3*) delivered by the French Government.
The Department of Biosciences trains multidisciplinary engineers, intended to be project managers, specialized in Healthcare, Agro-food and Environmental industries.  

2 main training programmes are offered in the Department: 
Biochemistry and Biotechnologies provides engineers with a solid scientific and technical background in Life Sciences and Healthcare; shapes them to work in Environmental, Pharmaceutical, Agro-Food and various other fields of chemistry; trains them for management positions, quality control and consulting in industries. 

Bio-Informatics and Modeling, designed in collaboration with the University Claude Bernard Lyon 1, trains engineers to be interfaces between biologists, mathematicians and computer scientists; analyze and process biological data, extract relevant information and model biological systems in order to understand the processes of life.

## SEMESTER 1 (SEPTEMBER - JANUARY)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary Differential Equations and Modeling</td>
<td>4</td>
</tr>
<tr>
<td>Algorithmics and Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>Computer Architecture and Operating Systems</td>
<td>1</td>
</tr>
<tr>
<td>Databases</td>
<td>1</td>
</tr>
<tr>
<td>Linear Algebra and Matrix Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Population Genetics and Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>Difference Equations, PDE</td>
<td>4</td>
</tr>
<tr>
<td>Theoretical Computer Science</td>
<td>2</td>
</tr>
<tr>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>Stochastic Processes and Stochastic Calculus for Biology</td>
<td>2</td>
</tr>
<tr>
<td>Signal and Image Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Project in Biological Systems Simulation</td>
<td>2</td>
</tr>
<tr>
<td>Modeling of Biological Networks</td>
<td>3</td>
</tr>
<tr>
<td>Structural Virology</td>
<td>2</td>
</tr>
</tbody>
</table>

## SEMESTER 2 (FEBRUARY - JUNE)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial Differential Equations and Modeling</td>
<td>2</td>
</tr>
<tr>
<td>Software Development</td>
<td>3</td>
</tr>
<tr>
<td>Software Development Project</td>
<td>1</td>
</tr>
<tr>
<td>X-Ray Crystallography</td>
<td>1</td>
</tr>
<tr>
<td>High Performance Computing and Development</td>
<td>2</td>
</tr>
<tr>
<td>Game Theory</td>
<td>1</td>
</tr>
</tbody>
</table>

## BIBLIOGRAPHICAL PROJECT

The bibliographical project aims at preparing engineering students for research. They will have to carry out a bibliographical research and a critical analysis of the literature, on a given issue.

Objectives:
1) Search for information on a specific topic (vocabulary, literature sources, database queries);
2) Evaluate the information found (selection, justification);
3) Exploit the selected documents;
4) Write a bibliographical report using the appropriate template and citations.

## RESEARCH PROJECT

**FULL TIME 30 ECTS / HALF TIME 15 ECTS**

The research project will take place in a laboratory associated with the Department of Biosciences. The student will be mentored by an experienced teacher. Topics are defined independently or in collaboration with companies.

> Associated labs

**BF2I – Functional Biology, Insects and Interaction**
http://bf2i.insa-lyon.fr/en/

**CARMEN – Cardio-Metabolism, Diabetes and Nutrition**
http://carmen.univ-lyon1.fr/?lang=en

**ICBMS – Institute for Molecular and Supramolecular Chemistry and Biochemistry**
http://www.icbms.fr/

**MAP – Microbiology, Adaptation and Pathogenesis Laboratory**
http://map.univ-lyon1.fr/

> Contact: ri-bs@insa-lyon.fr
The Department of Civil Engineering and Urban Planning provides education in the scientific and technical fields of civil engineering and urban planning:

- Building Design, Construction and Management
- Infrastructure Design, Construction and Management
- Urban Development and Renovation.

Major scientific fields addressed: Geotechnics; Material and Structural Analysis; Heat and Mass Transfer; Indoor and Outdoor Acoustics and Lighting; Heating, Ventilation, and Air Conditioning (HVAC); Building Energy Management; Water Management and Hydraulics.

A particular attention is paid to cross-disciplinary fields of study: Engineering and Management Tools; Environmental Science; Humanities; Economics and Social Science.

### COURSE

<table>
<thead>
<tr>
<th>COURSE</th>
<th>SEMESTER</th>
<th>NUMBER OF ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>S1</td>
<td>2</td>
</tr>
<tr>
<td>Computer-Aided Design (CAD)</td>
<td>S2</td>
<td>1</td>
</tr>
<tr>
<td>Urban drainage</td>
<td>S1 or S2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

#### CHOICE OF 2 MODULES OUT OF 4:

<table>
<thead>
<tr>
<th>Module</th>
<th>SEMESTER</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy management in Buildings</td>
<td>S2</td>
<td>5</td>
</tr>
<tr>
<td>Advanced structural modellings</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Integrated urban water management</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

#### CHOICE OF 2 MODULES OUT OF 3:

<table>
<thead>
<tr>
<th>Module</th>
<th>SEMESTER</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building design: multidisciplinary approach</td>
<td>S2</td>
<td>5</td>
</tr>
<tr>
<td>Adapting cities for climate change</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Numerical modelling in geomechanics</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

### SEMESTER 1 (SEPTEMBER - JANUARY), SEMESTER 2 (FEBRUARY - JUNE)

#### INDIVIDUAL PROJECT

**Bachelor degree level**

The topic and program are defined with a mentor from the Department and are related to Civil Engineering.

> Contact: jean-francois.georgin@insa-lyon.fr

#### RESEARCH AND DEVELOPMENT PROJECT

**FULL TIME 30 ECTS / HALF TIME 15 ECTS**

**Master degree level**

The project aims at developing the following knowledges and abilities:

- Understand the nature of R&D activities and challenges for innovation;
- Acquire advanced knowledge in some fields of civil engineering and urban planning, and/or acquire knowledge in complementary fields;
- Discover the limits between well founded knowledge and incomplete/uncertain knowledge;
- Implement scientific principles and methods on a specific research project;
- Develop general abilities (project management, writing reports and scientific papers, oral communication, etc.)

The subject and program are defined with a mentor from the Department and are related to:

- Heat & Mass Transfers in Buildings
- Materials and Structures
- Soils, Geo-materials
- Urban Techniques & Society (a good level of French can be required - for this domain only)
- Urban Water Management

> Contact: stephane.grange@insa-lyon.fr

### Associated labs

- **CETHIL** - Energy and Thermal Engineering
  cethil.insa-lyon.fr
- **DEEP** - Waste Water Environment Pollutions
  deep.insa-lyon.fr
- **EVS** - Environment City Society
  umr5600.cnrs.fr

> Contact: gcu@insa-lyon.fr
The Department of Electrical Engineering trains multidisciplinary engineers in the field of electrical systems. This training provides students with theoretical and practical knowledge in Electronics, Electrotechnical engineering, Automation, Industrial Informatics and Telecommunications (EEAIIT). Activities related to EEAIIT include: electronic systems for professional and public environments, integrated circuit design, energy production and management, control and supervision of production systems, information technology, telecommunications equipment, network operators...

**SEMESTER 1 (SEPTEMBER - JANUARY)**

- Transmission Lines .................................................. 2 ECTS
- Electronics and Sensors ............................................ 2 ECTS

**SEMESTER 2 (FEBRUARY - JUNE)**

- Heat transfer ............................................................... 2 ECTS

**SEMESTER 1, SEMESTER 2**

**TECHNICAL PROJECT** .................................................. 3 ECTS

The project is carried out by a group of students [2 or 3] and covers various aspects of Electrical Engineering. The aim is to design, carry out, test and validate a device or an electrical system defined by a customer. Through this project, students develop initiative and autonomy skills but also their ability to defend their choices and results.

**RESEARCH PROJECT** .................................................. 20 ECTS

Master degree level

The research project takes place in one of the labs associated to the Electrical Engineering Department. An experienced teacher will mentor the student. Topics are most of the time raised by the researcher himself or in collaboration with companies.

> Contact : ge-secretariat@insa-lyon.fr

> Associated labs

**AMPERE** - Electrical engineering, electromagnetism, automation, environmental microbiology and applications
ampere-lab.fr

**CITI** - Center of Innovation in Telecommunications and Integration of Services
citi-lab.fr

**CREATIS** - Biomedical Imaging Research Lab
creatis.insa-lyon.fr

**ICJ** - Institut Camille Jordan, Mathematical Sciences
math.univ-lyon1.fr

**INL** - Lyon Institute of Nanotechnology
inl.cnrs.fr

**LGEF** - Electrical Engineering and Ferroelectricity Lab
lgef.insa-lyon.fr

ECTS = European Credits Transfer System
The Department of Mechanical Engineering aims to train mechanical engineers in the fields of innovation, R&D and product design and manufacturing. They develop the capacity to carry out major projects, from an original idea to an end product. 2 sites: one on the main campus LyonTech-La Doua and the other in Oyonnax, in the heart of the Plastics Vallée. Therefore, some courses take place on the Oyonnax campus.

Areas of activity: energy, transports, biomedical and health, sports and leisure, mechatronics and robotics, luxury industry, mechanical constructions and industrial machinery, eco-industry, buildings, plastics processing...

**SEMESTER 1 (SEPTEMBER - JANUARY)**

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Mathematics 1</td>
<td>4</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Engineering materials</td>
<td>8</td>
</tr>
<tr>
<td>Computer science &amp; Numerical methods</td>
<td>4</td>
</tr>
<tr>
<td>Mechanism analysis</td>
<td>6</td>
</tr>
<tr>
<td>Multi-Physics System modelling</td>
<td>8</td>
</tr>
<tr>
<td>Computer Aided Design of Mechanical System</td>
<td>1</td>
</tr>
</tbody>
</table>

**DESIGN PROJECT: FROM A NEED TO PROTOTYPE** 12 ECTS

This is a teamwork project. The objective is to give a solution to a need expressed by a customer (a company, an artist, an association...), providing a scientific and technical answer. At the end of the project, the functional specifications must be drafted and a first iteration of the solution must be tested. This solution can take the form of a digital solution. The project must lead to a «go/no go» decision.

**SEMESTER 2 (FEBRUARY - JUNE)**

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of Structural Vibrations</td>
<td>6</td>
</tr>
<tr>
<td>Theory of Elasticity</td>
<td>6</td>
</tr>
<tr>
<td>Control of Linear Systems</td>
<td>6</td>
</tr>
<tr>
<td>Mechanical Design of machine elements</td>
<td>6</td>
</tr>
</tbody>
</table>

**SCIENTIFIC AND TECHNICAL PROJECT** 8 ECTS

Analyzing a given problem, constructing and applying a solving approach. Developing capabilities of autonomy and initiative. Presenting obtained results (written report, oral). Showing the ability to defend choices and results.

**SEMESTER 1, SEMESTER 2 RESEARCH/ENGINEERING PROJECTS FULL TIME 30 ECTS / HALF TIME 15 ECTS**

The exchange students will work closely with a faculty member on a project which is related to industrial or academic research activities, in one of the associated labs to the Department listed below.

> Contact: gm-direction@insa-lyon.fr

> Associated labs

**AMPERE** - Electrical engineering, electromagnetism, automation, environmental microbiology and applications amperelab.fr

**CETHIL** - Energy and Thermal Engineering cethil.insa-lyon.fr

**CREATIS** - Research Centre for Image Acquisition and Processing for Health creatis.insa-lyon.fr

**DISP** - Decision and Information Systems for Production systems disp-lab.fr

**IMP** - Polymer Materials Engineering imp.cnrs.fr

**LAMCOS** - Contacts and Structures Mechanics Laboratory lamcos.insa-lyon.fr

**LMFA** - Fluid Mechanics and Acoustics Laboratory lmfa.ec-lyon.fr

**LVA** - Vibrations and Acoustics Laboratory lva.insa-lyon.fr

**MATEIS** - Materials Science Laboratory mateis.insa-lyon.fr/en

ECTS = European Credits Transfer System
**Industrial Engineering**

Industrial engineering concerns production systems, supply and/or distribution of goods or services, their design, implementation, management and improvement with a systemic vision. Industrial engineers are multidisciplinary. They are production managers, able to design, implement and manage complex industrial systems while considering all the technical, organizational, financial and human factors. They are involved in organising the company in accordance with the principles of sustainability. They apply their skills to improve performance, quality and safety.

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### Semester 1 (September - January)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design of experiments</td>
<td>1</td>
</tr>
<tr>
<td>Mechanical properties of materials</td>
<td>3</td>
</tr>
<tr>
<td>Probabilities and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Project management</td>
<td>1</td>
</tr>
<tr>
<td>Scheduling and flow management</td>
<td>2</td>
</tr>
<tr>
<td>Simulation - Overview</td>
<td>1</td>
</tr>
<tr>
<td>Data Warehouse</td>
<td>3</td>
</tr>
<tr>
<td>Supply chain and implementation of production systems</td>
<td>3</td>
</tr>
<tr>
<td>Sourcing process and supplier survey</td>
<td>1</td>
</tr>
<tr>
<td>Lean</td>
<td>2</td>
</tr>
<tr>
<td>Introduction to scientific research</td>
<td>1</td>
</tr>
</tbody>
</table>

### Semester 2 (February - June)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality-Maintenance</td>
<td>2</td>
</tr>
</tbody>
</table>

### Semester 1, Semester 2

**Research Project**

The reception and supervision of students takes place in a scientific laboratory. The student works on a well-defined scientific problem, following a project approach, which requires managing objectives, planning, monitoring and deliverables. The host laboratories are DISP and AMPERE. Available on application and selection, and depending on subject availability.

> Contact: gi@insa-lyon.fr

> Associated labs

**AMPERE** - Electrical engineering, electromagnetism, automation, environmental microbiology and applications

amper-lab.fr

**DISP** - Decision and Information Systems for Production systems
disp-lab.fr

**LAMCOS** - LaMCoS - Contacts and Structures
Mechanics Laboratory
lamos.insa-lyon.fr

**LIRIS** - Computer Science Laboratory for Image Processing and Information Systems
liris.cnrs.fr

**ECTS** = European Credits Transfer System
The Information Science & Technology Semester is a program jointly organized by 3 engineering departments of INSA Lyon:
- Telecommunication Department
- Computer Sciences and Engineering Department
- Electrical Engineering Department
In collaboration with 3 research laboratories: CITI, CREATIS, LIRIS.
A full IST semester program is composed of six scientific courses (to be chosen out of 12) associated to a research project, conducted in one of the 3 research laboratories and which develops high level research in the fields covered by the IST semester. Each week of the IST semester program is structured with 2 days of courses and 3 days in research labs. Note that, the French language course (2 hours per week) is given all throughout the semester in parallel to these courses and projects.

**SEMESTER 1 [SEPTEMBER - DECEMBER]**

**TELECOMMUNICATIONS**
- Signal and Image Processing Part 1 - Signal Processing: 3 ECTS
- Signal and Image Processing Part 2 - Signal Processing: 3 ECTS
- Microwave Systems for Telecommunications Part 1 - Transmission lines: 3 ECTS
- Microwave Systems for Telecommunications Part 2 - Antennas and Propagation: 3 ECTS

**IT**
- Java Programming: 3 ECTS
- Middleware design and implementation: 3 ECTS
- Operating Systems: 3 ECTS
- Data bases and data mining Part 1 - Data Bases: 3 ECTS
- Data bases and data mining Part 2 - Data Mining: 3 ECTS
- Software Engineering: 3 ECTS

**NETWORKS AND SERVICES**
- Part 1 - Networks: 3 ECTS
- Part 2 - Networks: 3 ECTS

**RESEARCH PROJECT**
- 10 ECTS

The students will choose a subject and work within a research team. They will have to build up a bibliographic study in order to develop their own contributions which will be presented in a final report and during an oral presentation. This research project can finish at the end of January.

**SEMESTER 2 [FEBRUARY - JUNE]**

**RESEARCH PROJECT**
- 30 ECTS

The students can lead a research project during a whole semester and thus have enough time to deepen a project and develop a complex and elaborated contribution. A publication and/or a bachelor thesis can be validated at the end of this period.

Subjects cover a wide range of IT fields

Examples of defended thesis:
- Big Data Analytics with Counter-Strike CS:GO
- National Instruments Wireless Transmission Platform
- Programming Distributed Systems in Vert.X & Golo.

> Contact: ist@listes.insa-lyon.fr - www.insa-lyon.fr/en/ist

> Associated labs

**CITI** - Center of Innovation in Telecommunications and Integration of Services
citi-lab.fr

**CREATIS** - Biomedical Imaging Research Lab
creatis.insa-lyon.fr

**LIRIS** - Computer Science Laboratory for Image Processing and Information Systems
liris.cnrs.fr

ECTS = European Credits Transfer System
The Department of Materials Science and Engineering (SGM) trains general engineers whose competencies range from the conception to the manufacturing of built-up products in advanced technology industries. Those industries concern the fields of advanced materials (semiconductors, metals and alloys, polymers, composites, ceramics) and micro and nanotechnologies components. Materials engineers take part in research and development, design, production, quality in different fields such as the industry of electronic components, petrochemistry, iron and steel industry, automotive, aeronautics, construction, energy, packaging, biomedical, cosmetics etc.

### SEMESTER 1 [SEPTEMBER - JANUARY]

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics of Materials – Solid state physics</td>
<td>3</td>
</tr>
<tr>
<td>Mechanics – Elasticity and beam mechanics</td>
<td>2</td>
</tr>
<tr>
<td>Material Mechanics – Mechanical behaviour of materials</td>
<td>4</td>
</tr>
<tr>
<td>Materials engineering – Material selection</td>
<td>2</td>
</tr>
<tr>
<td>Nanotechnology – Nanofabrication of advanced integrated circuits</td>
<td>2</td>
</tr>
<tr>
<td>Optoelectronics – Photonic materials and components</td>
<td>2</td>
</tr>
<tr>
<td>Microelectronics Integrated Electron Devices</td>
<td>2</td>
</tr>
<tr>
<td>Nanotechnology and Semiconductors</td>
<td>2</td>
</tr>
<tr>
<td>Chemistry – Polymer formulation and blends</td>
<td>2</td>
</tr>
<tr>
<td>Materials and Life Science - Biomaterials</td>
<td>2</td>
</tr>
</tbody>
</table>

### SEMESTER 2 [FEBRUARY - JUNE]

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronics – Semiconductor Materials</td>
<td>2</td>
</tr>
<tr>
<td>Finite Elements Simulation</td>
<td>2</td>
</tr>
</tbody>
</table>

### SEMESTER 1, SEMESTER 2

#### RESEARCH PROJECT

The research project will take place in a laboratory associated with the Department of Materials and Engineering. The student will be mentored by an experienced teacher. Topics are mostly suggested by a company.

Examples of defended thesis:
- Simulation of hip implants: optimization of the shape of the implants according to the patient
- 3D manufacturing of metals by robocasting
- Effect of an applied current on phase transformations.

> Contact: sgm@insa-lyon.fr

> Associated labs

**IMP** - Polymer Materials Engineering
imp.cnrs.fr

**INL** - Lyon Institute of Nanotechnology
inl.cnrs.fr

**MATEIS** - Materials Science Laboratory
mateis.insa-lyon.fr

*ECTS = European Credits Transfer System*
The Department of Energy and Environmental Engineering (GEn) of INSA Lyon offers training opportunities for future professionals, operating in the fields of energy and environmental sciences. The multi-skill academic program enables our students to work in various sectors including energy production and supply, energy efficiency, HVAC and building energy performance, energy consulting, process engineering, waste management, etc.

### RESEARCH AND DEVELOPMENT PROJECT 25 ECTS
This internship is an initiation to scientific research carried out under the supervision of an experienced researcher and lasts from 10 to 15 full weeks. It aims to deepen knowledge and abilities in a research problem in scientific English, and to develop experimental (computational) skills. At the end of the internship, the student is expected to demonstrate that he/she can conduct a research project and that he/she has learned how to work independently in a research team. It requires creative, self-critical and communication skills. The project is carried out in one of the following themes: energy (CETHIL laboratory) or environment (DEEP laboratory).

### SEMESTER 1 [SEPTEMBER - JANUARY]

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenges and opportunities in environmental management</td>
<td>4</td>
</tr>
<tr>
<td>Waste treatment</td>
<td>3</td>
</tr>
<tr>
<td>Wastewater treatment</td>
<td>3</td>
</tr>
<tr>
<td>Biomass &amp; waste to energy</td>
<td>3</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>5</td>
</tr>
<tr>
<td>Fossil and nuclear energy – Energy Market</td>
<td>3</td>
</tr>
<tr>
<td>Energy Optimisation</td>
<td>2</td>
</tr>
<tr>
<td>Numerical analysis using EXCEL/VBA</td>
<td>2</td>
</tr>
<tr>
<td>Numerical method using Matlab</td>
<td>2</td>
</tr>
<tr>
<td>Research and development project</td>
<td>25 or 30</td>
</tr>
<tr>
<td>Short research project</td>
<td>15</td>
</tr>
</tbody>
</table>

### SEMESTER 2 [FEBRUARY - JUNE]

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFD software</td>
<td></td>
</tr>
<tr>
<td>Chemical engineering simulation software</td>
<td>2</td>
</tr>
<tr>
<td>Numerical analysis using Matlab</td>
<td>2</td>
</tr>
<tr>
<td>Research and development project</td>
<td>25 or 30</td>
</tr>
<tr>
<td>Short research project</td>
<td>15</td>
</tr>
</tbody>
</table>

> Contact: gen-s@insa-lyon.fr

> Associated labs

**CETHIL** - Energy and Thermal Engineering
cethil.insa-lyon.fr

**DEEP** - Waste Water Environment Pollutions
deep.insa-lyon.fr/en

ECTS = European Credits Transfer System
INNOV@INSA: 2 SUMMER PROGRAMS
MAY-JUNE AND JUNE-JULY

ACQUIRE VALUABLE INTERNATIONAL EXPERIENCE IN EUROPE
WHILE GETTING 6 US CREDITS / 12 ECTS

1st REQUIRED COURSE
French Language, Cross Cultural Communication, Industry and Society
- Learn the basics of French language
- Understand the impact of different industries on society
- Develop Intercultural Competence

2nd REQUIRED COURSE TO BE CHOSEN BETWEEN

- Connected Devices and Smart Devices*
  - Evaluate technical challenges and opportunities in the IoT
  - Design and build smart services for assistive and ambient environments

- Management and Innovation in Europe
  - Team challenge: conceive and present an innovative technological product for the French market
  - Acquire product development and entrepreneurial skills
  - Project Management

ACTIVITIES

- 2 day trips
  - Annecy, the French Venice
  - Chamonix Mont Blanc, the highest peak in Europe

- Cultural and fun activities
  - Opening Dinner in a local restaurant
  - Orienteering with an INSA student’s association in Lyon city centre
  - Cooking activity
  - Industrial and lab visits
  - On-site study trips
  - Farewell Cocktail at Skyroom, 27th floor of one of the highest tower in Lyon

* course only available in the May-June program

Contact:
- INNOV@INSA in May-June: innov-may@insa-lyon.fr
- INNOV@INSA in June-July: innov-july@insa-lyon.fr

www.insa-lyon.fr/en/summer-programs

ECTS = European Credits Transfer System