

## Master in Signal and image processing

# Signal image processing methods and applications

### Presentation

---

The SIGMA master provides students the tools to deepen their knowledge and develop their expertise in the field of digital signal and image processing, computer sciences and information technologies. A particular emphasis is put on fundamental skills and tools for signal and systems modeling, information extraction from experimental data as well as information representation and conditioning.

The program is dedicated to provide the students the necessary competences to become creative specialists in various areas involving numerical technologies, such as biomedical signal processing, observational sciences (geosciences, monitoring, remote sensing,), artificial intelligence (machine learning, statistical inference, computational Bayes methods) to mention a few. The master is designed to prepare for PhD studies in the fields of electrical engineering and computer sciences, with a focus on digital methods. An important part of the lectures is dedicated to introduce present research and development topics ; this teaching is organized into a series of short lectures given by professional and researchers from companies or labs developing research or applications in the field of information technologies.

A 5 to 6 months internship in a research lab or in a company involved in R&D is part of the cursus.

### Registration and scholarships

---

#### Access conditions

M1: The candidate should have a license degree, studied 3 years in university level or validated an equivalent of 180ECTS in the fields of applied mathematics, computer science or electronic systems

M2: The candidate should have a M1 level, studied 4 years in university level or validated an equivalent of 240ECTS in the field of applied mathematics, computer science or electric systems. Also, the candidate should prove sufficient english level (CEFR (B2), TOEFL (IBT 87-109), IELTS (5.5-6.5), TOEIC (785-945) or equivalent).

Engineer/Master Dual Degree accessible to Phelma Engineering degree students who have validated the 2nd year of SICOM field of study.

[skin.odf-uga:SKIN\\_ODF\\_CONTENT\\_PROGRAM\\_CANDIDATURE\\_LABEL](#)

Visit [the SIGMA website](#) for more information on application timeline and procedures.

More information on entry requirements to Grenoble INP on [this page](#).

Your application is to be submitted online through [this platform](#).

#### Expenses

The cost of an academic year is €12,000 which is almost entirely covered directly by the French ministry of higher education and research. French and European students required to pay €243 registration fees. Meanwhile, Non-European enrolling for the first time in a university program are required to pay €3770 , excluding the compulsory health insurance fees. However, these registration fees can be waived partially or totally upon decision of the admission panel based on social criteria. Candidates can request an exemption in their application.

The registration fee is further reduced to €159 if the student is enrolled in the same institution to prepare multiple diplomas

More about the cost of life in Grenoble is covered in [student life section](#)

## Further studies

---

SIGMA program is designed to prepare students for a research and/or development career in signal and image processing. Graduates can follow a PhD program in a laboratory or a research and development division of a company. Thanks to its partnership with elite research laboratories and innovative companies, SIGMA graduates have several PhD opportunities.

## Practicals informations :

---

- > Component : Grenoble INP - Phelma (Physique, électronique et matériaux), Grenoble INP - Pagora (Ecole internationale du papier, de la communication imprimée et des biomatériaux)
- > level : Baccalaureate +5
- > Duration : 2 years
- > Course type : Initial and Continuing Education
- > Location(s) : Grenoble - University campus

## Contacts

---

### Program director

Phlypo Ronald  
Ronald.Phlypo@grenoble-inp.fr

Michel Olivier  
Olivier.Michel@grenoble-inp.fr

### Program administration

Contact SIGMA  
team.msigma@phelma.grenoble-inp.fr.

Chapays Noelle  
Noelle.Chapays@grenoble-inp.fr

## Program

---

M1

### Semester 7

- **Elective courses (4 ECTS - 4h)**

- Workshop
- Challenges of corporate social responsibility
- Continuation of studies/graduation meeting

- Company visits
- CV workshop
- **Computational statistics and statistical learning (6 ECTS - 30h)**
- **Initiation to experiment design and research (6 ECTS - 34h)**
- **Foreign Language I (2 ECTS - 24h)**
- **Lab project I (4 ECTS - 42h)**
- **Scientific programming (6 ECTS - 30h)**

- **Signals and systems (6 ECTS - 30h)**

### **Semester 8**

- **Lab project II (4 ECTS - 112h)**
- **Image processing (6 ECTS - 33h)**
- **Dynamics system analysis (6 ECTS - 30h)**
- **Data challenge (6 ECTS - 70h)**
- **Intro to Real-Time Computing: interfacing Arduino with Python (6 ECTS)**

### **M2**

#### **Semester 9**

- **Fundamentals of signal, image, information (9 ECTS)**
- **Advanced mathematical tools and methods (6 ECTS)**

#### **Two tracks to chose from:**

- **Image, Multimedia, Audio and Communication - IMMAC (French)**
  - Audio and multimedia (6 ECTS)
  - Coding, image and communications (6 ECTS)
- **Energy, Environnement and Health - EEH (English)**
  - Geo-science and environnement (6 ECTS)
  - Monitoring and diagnostics (energy and health) (6 ECTS)

#### **Semester 10**

- **Introduction to research seminars (6 ECTS)**
  - Seminars - scientific paper studies
  - Scientific writing

- **Data Challenge (pre-doctoral winter school)**

- **Long internship (4-6 months) (24 ECTS)**

- **Master's thesis**