Tuition Fees

- Application fees : €65
- Program cost for non-European citizens : €14, 000
- Program cost for European citizens : €8,000

€4,000 scholarships are available (see our website for details)

Entry Requirements

- Completed Bachelor Degree in Electrical Engineering, Aerospace Engineering, Mathematics, Physics or equivalent.
- Proof of a sufficient english level: TOEFL ≥ 550 (PBT), TOEFL ≥ 213 (CBT), TOEIC ≥ 750, BULATS ≥ 70, D-C-L degree 4 or equivalent.

ENAC, Europe's Leading Aeronautical University

- 3 Bachelor's degree programs
- 6 Master's degree programs
- 10 «Mastères Spécialisés» including 3 in China
- Continuous training: 500 short courses
- 4 Research laboratories.
- International activities: over 15,000 students and foreign trainees from 100 countries.

The ENAC is located on a vast 20-hectare campus, with teaching premises, student residence halls, restaurant, sports and cultural facilities.

Toulouse

Toulouse: the second largest university city in France,
European capital city for aeronautics and space industries

It is the scientific base for leading companies and institutions, such as Thalès Alenia Space, EADS Astrium, the French Space Agency (CNES), Airbus, and many SMEs associated with the world of GNSS and telecommunications.

Application Procedure

- **Application:** is online on www.enac.fr/en
- **Application calendar:** One monthly selection jury (see website for details). «First-come first-serve process» to select applicants.
- **Selection process:** Application files assessment (followed by an interview if necessary).
- **€4,000 scholarships:** Please inform the course director by email. The decision will be given mid-July at the latest.

- **For more information, please contact:**
- Anne-Christine ESCHER (Course Director) at anne-christine.escher@enac.fr
- Nathalie MARTINEZ (Admission & Campus Life) at nathalie.martinez@enac.fr

2012

GNSS

Master of Science in Global Navigation Satellite System

ENAC

La référence aéronautique

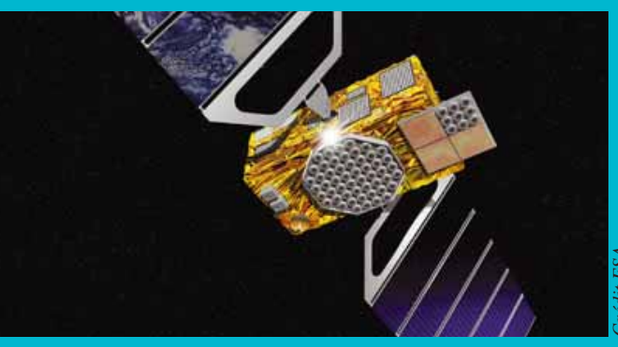
www.enac.fr

Crédit ESA

The Master of Science (MSc) in Global Navigation Satellite System (GNSS) is a 2-year program offering advanced education in satellite-based positioning and telecommunications. It aims at training students for the steadily growing GNSS industry.
It is co-organized by ENAC and ISAE (Institut Supérieur de l'Aéronautique et de l'Espace) in Toulouse, the French capital city of space and aeronautics.
This MSc in GNSS has been developed with the support of the European Commission and the European GNSS Agency.

Objectives

Global Navigation Satellite Systems (GNSSs) have gained a lot of worldwide attention due to a significant increase in applications using GPS for positioning and navigation (aeronautics, vehicular and pedestrian navigation, location-based services, etc). This international enthusiasm is confirmed by the worldwide development of other global and regional satellite-based navigation systems in Europe, the USA, China, Russia, India and Japan, creating a strong need for experts in this field. The objective of this MSc in GNSS is to provide students with advanced skills and knowledge in the field of GNSS and its related applications, in order to prepare them to enter the highly dynamic GNSS and GNSS-dependent industry. In addition, the students have a training in telecommunications, as both fields are strongly complementary.



Crédit ESA

Career Opportunities

Recent studies have shown that there will be a lack of graduate students to fill the open positions in the GNSS industry in the near future. This MSc in GNSS provides students with a head start in the evolving and growing market of satellite-based navigation and telecommunications.
Hence, graduate students can enter:

- large companies,
- SMEs,
- national institutions,
- research laboratories.

Course Contents

The course program is a combination of lectures, tutorials, applied projects and assignments.

1st SEMESTER (30 ECTS):

- Fundamentals in mathematics
- Fundamentals in signal processing and electromagnetism
- Introduction to GNSS: conventional navigation, background, concepts and evolutions
- Introduction to programming
- System engineering, project management
- Applied project

2nd SEMESTER (30 ECTS):

- Advanced signal processing
- Antennas and propagation channels
- GNSS II: positioning techniques, integrity monitoring, applications (civil aviation, precise positioning, scientific applications)
- hybridization between GNSS and other navigation sensors
- Introduction to telecom : networks' architecture, typical modulations, mobile applications
- Applied project

3rd SEMESTER (30 ECTS):

- Receiver design for navigation and telecom. users
- Advanced telecom: channel coding, space applications, satellite payload design
- GNSS III: Future GNSSs, signal design, alternative positioning techniques (vision, etc...), applications (pedestrian, vehicle, UAV)
- Management, team work, intellectual property, business in GNSS and telecom.
- Applied project

4th SEMESTER (30 ECTS):

5- to 6-month Internship in a company or a research laboratory. At the end of this intership, a report or oral presentation before a jury is to be carried out.

A European Partnership

This MSc in GNSS was developed with the support of the European Commission and the European GNSS Agency, GSA (7th Framework Programme under grant agreement nbr. 248016).
It has been achieved in partnership with the Institute of Space Technology and Space Applications of the Universität der Bundeswehr München (Germany) and Politecnico di Torino (Torino, Italy), both recognized for their leading international roles in education and research in the GNSS field. These two universities also contribute to the MSc teaching and provide their international links with the GNSS industry.

Universität der Bundeswehr München

isae Institut Supérieur de l'Aéronautique et de l'Espace

POLITECNICO DI TORINO 1859 1906

European GNSS Agency

Organisation

- Duration of studies: two years full time
- Course start date: September
- Location: Toulouse, France
- 2 periods: 3 semesters of courses at ENAC and 1 semester of in-company internship (assessed by a written report and an oral presentation)
- Teaching language: the entire programme is taught in English.

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