Ecole Nationale de l'Aviation Civile

MSC AEROSPACE SYSTEMS - NAVIGATION AND TELECOMMUNICATIONS

IN BRIEF

Type of diploma : Master of science degrees
Ministry field(s) : Science and Technology
Mention : Aéronautique et espace

Presentation

The Master of Science in GNSS, Global Navigation Satellite System, defines a satellite-based system that allows autonomous positioning and navigation of a suitably equipped user everywhere and at all times.

The Master of Science (MSc) in GNSS is a 2-year programme offering advanced education in Satellite-based Positioning and Space Telecommunications.

It aims at training students for the steadily growing GNSS industry.

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 will have a grounding in telecommunications, as both fields are strongly complementary.

Additional information

An International Cooperation

The Master AS-NAT was developed with the support of the European Commission and the European GNSS Agency, GSA (7th Framework Program under grant agreement nbr. 248016).

MORE INFO

Level : Year 5 higher education – Master

Training Audience
* Full-time

Kind of education : Curriculum

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.The MSc has also received the industrial support of Thales Alenia Space (France), Airbus (France), GMV (Spain), ISMB (Italy); as well as the institutional support of the UN.

Please, click   here   to access to the "Fiche RNCP" (Répertoire national des certifications professionnelles).

Organization

Year 1

Semester 7

- *Fundamentals of Mathematics (Mandatory)*
  · MA414E - Theory of distributions for signal processing
  · MA405E - Probability/Statistics
  · MA406E - Stochastic Processes
  · IP405E - Programming and C language
- *Fundamentals of Signal Processing and Electromagnetics (Mandatory)*
  · MO404E - Electromagnetics
  · SP4002E - Signal theory and signal processing
  · SP4003E - Digital signal processing
  · EE4002E - Analog filtering
  · AU408E - Linear servo loop system
- *GNSS 1 (Mandatory)*
  · NA402E - Introduction to GNSS and its evolutions
  · NA497E - PVT computation project
- *Language and Human Science 1 (Mandatory)*
  · LV401 - Culture and language French
  · LV406E - Culture and Language - English
  · LV409 - Culture and Language - other language

Semester 8

- *Intermediate Electromagnetism and Surveillance (Mandatory)*
  · MO4006E - Antenna and Propagation for GNSS
  · MO4004E - Propagation Channels Modeling
  · SV4010E - Surveillance Principles
- *Advanced Signal Processing 1 (Mandatory)*
  · SP4004E - Estimation-Detection

· SP5004E - Kalman Filtering
· AU409E - State Space Modeling, Analysis and Control
· SP4006E - Digital communications
- *GNSS 2 (Mandatory)*
· NA404E - GNSS for Civil Aviation
· NA403E - Differential GNSS Methods
· NA406E - Inertial Sensors and Hybridization Techniques
· NA4007E - Astrodynamics
- *Applied Project 2 (Mandatory)*
· NA491E - Applied project
· CP4005E - Course project - Market your Ideas
· CS406E - Introduction to System Engineering and Quality
· CS407E - Project Management
- *Language and Human Science 2 (Mandatory)*
· LV402 - Culture and Language - French
· LV407E - Culture and Language - English
· LV410 - Culture and Language - other language
· DD101E - Back to school Climate

Year 2

Semester 9

- *Advanced signal processing 2 (Mandatory)*
· SP5005E - Digital Receivers
· SP5015E - Array signal processing
· SP5002E - Parametric modeling
· SP5009E - Spread Spectrum Techniques
· NA5012E - Advanced concepts : GPS L1 C/A Receivers
- *Telecommunications 2 (Mandatory)*
· SP514E - Modern Channel Coding
· SP513E - Classical Channel Coding
· SP5007E - Spatial Technology
· AV5002E - On-board systems
- *GNSS 3 (Mandatory)*
· NA5020E - Future GNSS Signals
· NA5021E - High Sensitive Receivers - Urban positioning
· NA5022E - Alternative Positioning
· NA5023E - Business in GNSS
· NA5920E - GPS L1 C/A Receivers project
- *Applied project 3 (Mandatory)*
· NA499E - Applied project
- *Language and Human Science 3 (Mandatory)*
· LV501 - Culture and Language - French
· LV504E - Culture and Language - English
· LV411 - Culture and Language - other language
· DD102E - Societal issues
- *Semester 10 (Mandatory)*

· TX5900 - End of studies project internship

Professional insertion

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 join:

• large companies,

• SMEs,

• national institutions,

• research laboratories.

Organizational unit

ENAC - Ecole nationale de l'aviation civile

Places

Toulouse

Contacts

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