

## Avionics: Electronics (E030320)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits 4.0**

**Study time 120 h**

**Course offerings and teaching methods in academic year 2023-2024**

A (semester 2)

English

Gent

seminar

**Lecturers in academic year 2023-2024**

Vande Ginste, Dries

TW05

lecturer-in-charge

**Offered in the following programmes in 2023-2024**

**crdts**

**offering**

Master of Science in Electrical Engineering (main subject Communication and Information Technology )

4

A

Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)

4

A

**Teaching languages**

English

**Keywords**

Terrestrial radionavigation and landing systems (NDB/ADF, CVOR, DVOR, DME, TACAN, ILS, MLS, FMCW altimeter, GPWS), satellite navigation (GPS), radar, HF&VHF/UHF communication

**Position of the course**

Students will gain insight in the operational principles of the most important electronic systems as applied in aircraft and space technology.

Multidisciplinary approach based on electrotechnical basics, as applied in avionics

**Contents**

- Introduction to Avionics
- Radio Propagation for Avionics Systems
- Terrestrial En Route Radio Navigation
- Terrestrial Landing Aids
- Satellite navigation: Global Positioning System (GPS)
- Radar systems: Radar systems
- Communication systems: Communication systems
- Technical visit: Visit to the national airport (Belgocontrol - Zaventem)

**Initial competences**

Applied electromagnetics or Electromagnetics II; Analog electronics or Electronic systems and instrumentation; Communication theory

**Final competences**

- 1 To be able to describe, understand and discuss wave propagation in the atmosphere for avionics applications.
- 2 To be able to describe, understand and discuss terrestrial navigation and landing systems.
- 3 To be able to describe, understand and discuss satellite-based navigation and landing systems.

**Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

**Conditions for exam contract**

This course unit cannot be taken via an exam contract

**Teaching methods**

Seminar, Excursion, Lecture, Independent work

**Extra information on the teaching methods**

The course consists of lectures about theory and exercises, without making a strict, traditional distinction between them. All lectures are seminars which require interaction with and input from the students.

If circumstances permit (e.g., COVID-dependent circumstances), a mandatory company visit takes place.

**Learning materials and price**

- Book "Principles of Avionics", Avionics Communications Inc., Leesburg, VA, USA van Albert Helfrick, in English (85 EUR)
- Chapter on Radio Propagation for Avionics Systems (written and provided by the professor for free)
- Slides (made and provided by the professor for free)

**References****Course content-related study coaching**

The docent or his/her collaborators are available for explanations.

**Assessment moments**

end-of-term assessment

**Examination methods in case of periodic assessment during the first examination period**

Oral assessment open-book

**Examination methods in case of periodic assessment during the second examination period**

Oral assessment open-book

**Examination methods in case of permanent assessment****Possibilities of retake in case of permanent assessment**

not applicable

**Extra information on the examination methods**

During examination period: oral open-book exam

**Calculation of the examination mark**