

## Ethics, Engineering and Society (E075310)

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

**Credits 3.0**

**Study time 90 h**

**Course offerings and teaching methods in academic year 2024-2025**

A (semester 2)

Dutch

Gent

lecture

**Lecturers in academic year 2024-2025**

Segers, Seppe

LW01

lecturer-in-charge

**Offered in the following programmes in 2024-2025**

**crdts**

**offering**

Bachelor of Science in Engineering Technology(main subject Electronics and ICT Engineering Technology)

3

A

Bachelor of Science in Engineering Technology(main subject Information Engineering Technology)

3

A

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

3

A

Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)

3

A

Master of Science in Business Engineering(main subject Data Analytics)

3

A

Master of Science in Business Engineering (Double Degree)(main subject Data Analytics)

3

A

Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)

3

A

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

3

A

Master of Science in Electromechanical Engineering(main subject Maritime Engineering)

3

A

Master of Science in Electromechanical Engineering(main subject Mechanical Construction)

3

A

Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)

3

A

Master of Science in Business Engineering (Double Degree)(main subject Operations Management)

3

A

Master of Science in Business Engineering(main subject Operations Management)

3

A

Master of Science in Biomedical Engineering

3

A

Master of Science in Biomedical Engineering

3

A

Master of Science in Chemical Engineering

3

A

Master of Science in Chemical Engineering

3

A

Master of Science in Civil Engineering

3

A

Master of Science in Civil Engineering

3

A

Master of Science in Engineering Physics

3

A

Master of Science in Engineering Physics

3

A

Master of Science in Fire Safety Engineering

3

A

Master of Science in Industrial Design Engineering Technology

3

A

Master of Science in Information Engineering Technology

3

A

Master of Science in Materials Engineering

3

A

Master of Science in Sustainable Materials Engineering

3

A

**Teaching languages**

Dutch

**Keywords**

ethics, deontology, engineering, technique, society

## **Position of the course**

Provide a usable conceptual framework to the graduating engineer to stimulate a sense of public responsibility with respect to technological developments. Within the limited framework of this course it is not possible to cover an in depth treatment of the wide range of subjects related to ethical and social aspects of technological developments. On the basis of his acquaintance with the technical world in which engineers work, the lecturer will use an approach which stimulates the students to think, in a structured and independent way, about the role of technology in society and about ethically justified choices in relation to technical developments. The precise subjects may change from year to year. Examples of such subjects are listed hereafter.

## **Contents**

The course starts with an overview of the main schools in normative ethics (utilitarianism, virtue ethics and deontology). De analysis of these theories is oriented towards the profession of the engineer. A presentation of the importance of professional societies, codes of ethics (like the IEEE Code of ethics) and specific moral capacities of the engineer is given. In the second part, a discussion of typical problems of engineering ethics takes place: whistle blowing, loyalty to the employer, responsibility and complicity for products and processes, dual use, evaluation of risks etc.

## **Initial competences**

- Analysing both abstract and concrete problems
- Taking a stance regarding a problem
- Reflecting critically about the engineering profession
- Analysing societal consequences of new developments within the field of engineering or related fields
- Being conscious about the role of engineers in society

## **Final competences**

- 1 Describe, recognise and discern the main theories in normative ethics
- 2 Describe the core aspects in deontologic codes for professional engineers
- 3 Indicate the advantages and shortcomings of a deontologic code
- 4 Name and define the different models for allocating liability within a company
- 5 Indicate the advantages and disadvantages of different models for assigning responsibility
- 6 Assessing in which particular situations whistleblowing is justified or even ethically required
- 7 Assessing the limits of loyalty towards an employer
- 8 Explaining the importance and shortcomings of the non-compete clause
- 9 Discerning the different principles that are used in the practice of risk reduction
- 10 Being aware of the limits of risk-assessments in making ethical decisions
- 11 Having an insight into the complexity of ethical decision making in relation to technological developments
- 12 Reflecting about the role of technology in society
- 13 Making ethically sound decisions in relation to the development of technology
- 14 Integrating societal responsibility and engagement in the engineering profession
- 15 Having an insight into the dilemma of dual use research and technology

## **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, Lecture

## **Extra information on the teaching methods**

Classroom lectures and seminars to (i) illustrate actual moral case-studies in engineering praxis and (ii) to prepare for the exam.

**Study material**

None

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

end-of-term assessment

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

Written assessment open-book

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

Written 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**

The students analyse and discuss a case-study from engineering praxis on the basis of the material discussed in the course.

**Calculation of the examination mark**

Evaluation during examination period