

## The Information Society and ICT (E076320)

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

Credits 3.0 Study time 90 h Contact hrs 15.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	English	group work	0.0 h
		lecture	15.0 h

Lecturers in academic year 2020-2021

Develder, Chris	TW05	lecturer-in-charge
Demeester, Thomas	TW05	co-lecturer

Offered in the following programmes in 2020-2021

	crdts	offering
<a href="#">Bridging Programme Master of Science in Industrial Engineering and Operations Research</a>	3	A
<a href="#">Bridging Programme Master of Science in Industrial Engineering and Operations Research</a>	3	A
<a href="#">Master of Science in Electrical Engineering (main subject Communication and Information Technology )</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)</a>	3	A
<a href="#">Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Maritime Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Mechanical Construction)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)</a>	3	A
<a href="#">Master of Science in Information Engineering Technology</a>	3	A
<a href="#">Master of Science in Industrial Engineering and Operations Research</a>	3	A
<a href="#">Master of Science in Civil Engineering</a>	3	A
<a href="#">Master of Science in Chemical Engineering</a>	3	A
<a href="#">Master of Science in Civil Engineering</a>	3	A
<a href="#">Master of Science in Computer Science Engineering</a>	3	A
<a href="#">Master of Science in Computer Science Engineering</a>	3	A
<a href="#">Master of Science in Fire Safety Engineering</a>	3	A
<a href="#">Master of Science in Industrial Engineering and Operations Research</a>	3	A
<a href="#">Master of Science in Sustainable Materials Engineering</a>	3	A
<a href="#">Master of Science in Engineering Physics</a>	3	A
<a href="#">Master of Science in Chemical Engineering</a>	3	A
<a href="#">Master of Science in Engineering Physics</a>	3	A

Teaching languages

English

Keywords

information society, ICT, internet, social media, natural language processing (NLP)

## Position of the course

Extracting knowledge from vast amounts of digital data is an important opportunity as well as major challenge for our society and this in broadly varying application domains (energy, health, construction, transport, environment, etc.). In this, ICT plays a twofold role: on the one hand, recent developments caused more and more data to be produced and accessible (Internet, sensors, social media, ...), and on the other hand, ICT technology will form the basis of extracting knowledge from this plethora of data. These developments also have a major impact economically speaking. The objective of this course is to provide the student with insight of, on the one hand, the possibilities ICT offers to generate data and extract meaningful information out of it, and on the other hand, opportunities that thus arise to develop innovative applications. Also, social and economic opportunities and challenges will be discussed.

## Contents

- Evolution towards a “smart society”:
  - Key players driving and stimulating this evolution (cf. triple/quadruple helix)
  - Historical perspective of this evolution
- Technological components facilitating and enabling the “smart society”:
  - Internet-of-things (IoT): Communication networks and sensor technologies
  - Big data: Role of data analytics, machine learning, cloud computing
- Technical lectures on basic techniques underlying applications that unlock the potential of digital data: machine learning concepts and application in natural language processing (NLP), illustrated in Python
- Thematic lectures of the innovation process and application of ICT to address challenges in various sectors/application domains (e.g., smart grid, media publishers, transport, ...)
- The impact on the innovation process (illustrated through practical examples from industry).
- Interdisciplinary group assignment: Study on innovation based on ICT in a societal or industrial setting of choice, including a proof-of-concept application and/or data analysis (e.g., in Python, Matlab, Java, R ...).

## Initial competences

Basic programming experience (e.g., in Python, Java, Matlab, R)

## Final competences

- 1 Explain the role of ICT in the e-society in various sectors
- 2 Outline the problems associated with the strongly rising amount of digital data
- 3 Explain the triple/quadruple helix.
  
- 4 Explain the basic principles of machine learning strategies and their role in natural language processing.
- 5 Execute, in an interdisciplinary team, a small-scale project (including proof-of-concept application/analysis) on the influence of ICT in the modern e-society.

## 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

Group work, lecture

## Learning materials and price

Annotated presentation slides (in English) made available via Ufora

## References

## Course content-related study coaching

## Evaluation methods

end-of-term evaluation and continuous assessment

## Examination methods in case of periodic evaluation during the first examination period

Oral examination

## Examination methods in case of periodic evaluation during the second examination period

Oral examination

Examination methods in case of permanent evaluation

Assignment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Examination: presentation of assignment, and additional oral questioning

Project: assignment to be executed in small groups

Calculation of the examination mark

Examination 20%

Project: 80%