

## Information Technology and Data Processing (E076340)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

<b>Course size</b>	<i>(nominal values; actual values may depend on programme)</i>			
<b>Credits</b> 6.0	<b>Study time</b> 180 h	<b>Contact hrs</b>	60.0 h	

### Course offerings and teaching methods in academic year 2020-2021

A (semester 2)	Dutch	Gent	guided self-study	35.0 h
			seminar: practical PC room classes	10.0 h
			self-reliant study activities	5.0 h
			project	10.0 h
B (semester 2)	English		self-reliant study activities	5.0 h
			project	10.0 h
			lecture	35.0 h
			seminar: practical PC room classes	10.0 h

### Lecturers in academic year 2020-2021

Aelterman, Jan	TW07	lecturer-in-charge
Verbrugge, Sofie	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>	6	A
<a href="#">Bridging Programme Master of Science in Industrial Engineering and Operations Research</a>	6	B
<a href="#">Master of Science in Business Engineering (main subject Data Analytics)</a>	6	B
<a href="#">Master of Science in Business Engineering (main subject Operations Management)</a>	6	B
<a href="#">Master of Science in Industrial Engineering and Operations Research</a>	6	A
<a href="#">Master of Science in Industrial Engineering and Operations Research</a>	6	B

### Teaching languages

Dutch, English

### Keywords

ICT architecture, Internet, communication networks, data communications, relational databases, business models in the ICT domain

### Position of the course

The aim of this course is to provide students with a general overview of the ICT domain, data communications and data processing. This is treated from a utilitarian point of view of the user. Eventually, students should be able to speak, judge and decide about these domains in a professional manner. In this context, it is important also to be able to fit technical choices within the economic reality.

### Contents

#### Theoretical part:

Computer and communication network architecture. Technology and operating principles of the components of a modern computer system (processor, memory, storage, operating system...). Technology and operation of wired and wireless communication networks. The Internet and the role of protocol stacks (OSI, TCP/IP...). Network applications and information security. Application aspects of network architecture (client-server, P2P, ..., Quality of Service/Experience) and prominent

network application domains (search engines, cloud computing, smart grid). Principles of information security mechanisms and protocols.

Role of database systems in data processing: Overview of database models, the relational model and SQL.

Essential aspects of business modeling for ICT solutions. Cost modeling approaches for infrastructure, equipment as well as operational cost. Basic revenues schemes.

Main ideas of investment analysis for ICT projects of different scales.

Main principles of some important integrated information systems like data warehouse, enterprise resource planning and geographic information system. Basic concepts of big data and data mining behind these systems. Description of a range of system development approaches, including agile development.

**Practical part:**

Computer sessions on manipulating and retrieving data from relational databases using SQL.

Group project consisting of a technical and business related part.

**Initial competences**

None

**Final competences**

- 1 Assessing the structure and performance of computer architectures.
- 2 Assessing the structure of various wired and wireless network architectures.
- 3 Understanding the operation and role of network protocol architectures and information security principles.
- 4 Appreciating the capabilities and limitations of ICT applications.
- 5 Distinguishing database models and approaching SQL-based relational databases from the user perspective.
- 6 Assessing a prospective ICT offer on the market from a techno-economic perspective.
- 7 Deciding on an appropriate system development methodology in the ICT domain.

**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**

Guided self-study, lecture, project, self-reliant study activities, seminar: practical PC room classes

**Learning materials and price**

SQL-tutorial (in English, available on electronic learning platform), slides (in English, available on electronic learning platform) and related course notes (in English, available on electronic learning platform). Cost = 0 euro.

**References**

- Stallings, William; Computer Organization and Architecture, 10th Edition, International edition, Pearson Education, 2016, ISBN: 978-0134101613
- Osterwalder, Alexander; Pigneur, Yves; Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers, Wiley, 2010, ISBN: 978-0-470-87641-1
- Stallings, William; Case, Thomas; Business data communications, 7th edition, International edition, Pearson Education, 2012. ISBN: 9780273769163
- De Tré, Guy, Principes van databases, Amsterdam : Pearson education Benelux, 2007. ISBN: 9789043013024 Location: TBBS.QA76.9.D3

**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**

Written examination with open questions

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

Written examination with open questions

**Examination methods in case of permanent evaluation**

Peer assessment, report

**Possibilities of retake in case of permanent evaluation**

examination during the second examination period is not possible

**Extra information on the examination methods**

Periodic evaluation: written closed-book exam, except for the part about using SQL, where SQL tutorial can be used.

Non-periodical evaluation: assessment of the project based on report, peer assessment, oral presentation as well as related Q&A.

**Calculation of the examination mark**

The evaluation consists of two components: a non-periodical evaluation (project) and a periodic evaluation (exam). The evaluation of the project amounts to 30% of the final examination mark. The evaluation of the theoretical part is done through the exam (closed-book section), and amounts to 50% of the final examination mark. The evaluation of the skills acquired in the exercise sessions is done through the exam (open-book section), and amounts to 20% of the final examination mark.

If the student scores less than 10/20 for one of the evaluation components, he/she can no longer pass the entire course unit. If, in this case, the total score is a mark of ten or more out of twenty, then this is reduced to the highest failing mark.