Course Specifications

Valid as from the academic year 2016-2017

Information Technology and Data Processing (E076340)

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

Credits 6.0 **Study time 180 h** **Contact hrs** 60.0 h

Course offerings in academic year 2017-2018

A (semester 2)

B (semester 2)

Lecturers in academic year 2017-2018

Aelterman, Jan	TW07	lecturer-in-charge
Verbrugge, Sofie	TW05	co-lecturer

Offered in the following programmes in 2017-2018	crdts	offering
Bridging Programme Master of Science in Industrial Engineering and Operations Research	6	A
Bridging Programme Master of Science in Industrial Engineering and Operations Research	6	B
Master of Science in Business Engineering (main subject Data Analytics)	6	B
Master of Science in Business Engineering (main subject Finance)	6	B
Master of Science in Business Engineering (main subject Operations Management)	6	B
Master of Science in Industrial Engineering and Operations Research	6	A
Master of Science in Industrial Engineering and Operations Research	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.
Project consisting of a technical as well as a business related part. Basic technical design for an in-house ICT network deployment in a professional context. Business game simulating different ICT offers in a competitive market setting.

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 aproaching 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 Minerva platform), slides (in English, available on Minerva platform) and related course notes (in English, available on Minerva platform).

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.