

Network Modelling and Design (E004720)

Course size (nominal values; actual values may depend on programme)
 Credits 4.0 Study time 120 h Contact hrs 30.0 h

Course offerings and teaching methods in academic year 2018-2019

Offering	Language	Teaching Method	Hours
A (semester 2)	Dutch	guided self-study	12.5 h
		project	15.0 h
		seminar: coached exercises	2.5 h
B (semester 2)	English	seminar: coached exercises	2.5 h
		lecture	12.5 h
		project	15.0 h

Lecturers in academic year 2018-2019

Pickavet, Mario	TW05	lecturer-in-charge
Audenaert, Pieter	TW05	co-lecturer

Offered in the following programmes in 2018-2019

Programme	crdts	offering
Bridging Programme Master of Science in Industrial Engineering and Operations Research	4	B
Bridging Programme Master of Science in Industrial Engineering and Operations Research	4	B
Master of Science in Electrical Engineering (main subject Communication and Information Technology)	4	B
Master of Science in Business Engineering (main subject Data Analytics)	4	B
Master of Science in Business Engineering (main subject Finance)	4	B
Master of Science in Business Engineering (main subject Operations Management)	4	B
Master of Science in Industrial Engineering and Operations Research	4	A
Master of Science in Computer Science Engineering	4	B
Master of Science in Computer Science Engineering	4	B
Master of Science in Industrial Engineering and Operations Research	4	B

Teaching languages

Dutch, English

Keywords

network problems, complex networks, graph models, network design

Position of the course

The goal of this course is to give insight in the wide variety of network problems and their mutual similarities/differences. To introduce the concepts, models and techniques to efficiently solve these problems.

Contents

- Overview and diversity of network problems
- Network modelling and analysis
- Network traversal and routing
- Design of random networks
- Models for social networks and communication networks

- Advanced topics and recent evolutions

Initial competences

Basic mathematical knowledge (graph theory) and programming skills

Final competences

- 1 Representing real-life network problems via mathematical formulation.
- 2 Identifying similarities and differences between varying network problems.
- 3 Knowing the key techniques for solving important network problems.

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, seminar: coached exercises

Learning materials and price

Syllabus (5 Euro)

References

van Steen, Martinus Richardus, Graph theory and complex networks: an introduction, [S.I.] : Maarten van Steen, 2010. ISBN: 978-9081540612 Location: T57.SY.0865
Newman, M. E. J, Networks: an introduction, London : Oxford University Press. 2010. ISBN: 978-0199206650 Location: EBIB.EB02.PROJECTBOEK

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, open book examination

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

Written examination, open book examination

Examination methods in case of permanent evaluation

Oral examination, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Extra information on the examination methods

During examination period: written open-book exam

During semester: graded project reports; graded oral presentation. Second chance:

Possible in adapted form

Frequency: 1 project

Calculation of the examination mark

mpe = marks (on 20) on evaluation during examination period and mnpe = marks (on 20) on evaluation outside examination period

If (mpe smaller than 8 or mnpe smaller than 8)

then: score = minimum (mpe,mnpe)

else: **score = 0.5 x mpe + 0.5 x mnpe**