

Supply Chain Engineering (E076251)

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

Credits 6.0 Study time 180 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	seminar: coached	15.0 h
		exercises	
		group work	5.0 h
		lecture	35.0 h
B (semester 2)	Dutch	seminar: practical PC	5.0 h
		room classes	
		seminar: practical PC	5.0 h
		room classes	
		guided self-study	35.0 h
		seminar: coached	15.0 h
		exercises	
		group work	5.0 h

Lecturers in academic year 2018-2019

Raa, Birger	TW18	lecturer-in-charge
Aghezzaf, El-Houssaine	TW18	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
Master of Science in Industrial Engineering and Operations Research	6	B
European Master of Science in Photonics	6	A
Master of Science in Industrial Engineering and Operations Research	6	A

Teaching languages

Dutch, English

Keywords

supply chain management, distribution logistics, warehousing, inventory theory, forecasting, quantitative decision support tools, supply chain coordination

Position of the course

Whereas the course 'Manufacturing Planning & Control' of MaIEOR mainly considers the internal logistics of a production environment, this course looks beyond the four walls of a single company and studies the interaction of companies within (global) supply chains. The multiple functional aspects and decision-making levels of supply chain management are discussed, as well as coordination through integration across multiple supply-chain stages. All key managerial decision-making processes are supported by quantitative methods (as taught in the Operations Research courses of the MaIEOR).

Course sessions are highly interactive, active student participation is expected. The course is taught in ENGLISH.

Contents

- Functional aspects of SCM:
 - network design
 - demand forecasting
 - inventory control
 - warehousing
 - transportation planning

- Supply chain coordination:
 - supply management
 - customer & demand management
 - the bullwhip effect
 - horizontal and vertical collaboration
- Decision support systems for supply chain optimisation

Initial competences

Basic courses of both Operations Management and Operations Research

Final competences

- 1 Distinguishing the different aspects of distribution logistics and the decisions to be made, and relating these to each other.
- 2 Explaining the importance of risk management and information systems in supply chain management.
- 3 Proving that coordination and integrated decision making across the different stages of a supply chain can lead to performance improvement.
- 4 Thoroughly understanding the methods for designing and managing logistics networks and systems.
- 5 Building and applying mathematical models and formulas for integrated decision support.

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, group work, lecture, seminar: coached exercises, seminar: practical PC room classes

Learning materials and price

Lecture slides, relevant journal papers, exercises and case study material are made available on Minerva.

References

- L. Schnyder, Z.-J. Shen (2011), "Fundamentals of Supply Chain Theory", Wiley, ISBN 978-0470521304.
- A.R. Ravindran, D.P. Warsing (2013), "Supply Chain Engineering - Models and Applications", CRC Press, ISBN 978-1439811986.
- S. Chopra, P. Meindl (2016), "Supply Chain Management: Strategy, Planning and Operation (6/e)", Pearson Education, ISBN 978-0133800203.
- J.J. Bartholdi, III, S.T. Hackman (2016). "Warehouse & Distribution Science", <http://www.warehouse-science.com/book/index.html>

Course content-related study coaching

Teacher and assistant are available upon request. Minerva is used for additional material.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Oral examination, assignment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

- End-of-term: written exam theory + exercises, with additional oral discussion of theory questions
- Permanent (group work): one research-related assignment and one practice-related assignment in the course of the semester with written and oral reporting

Calculation of the examination mark

Permanent: 20% of final mark

End-of-term: theory + exercises (both 40% of final mark)

(A score of at least 40% for both the theoretical exam and the exercise exam is required to pass.)

The final score F is determined as follows (with T score for theory out of 20, E score for exercises out of 20, and P score for permanent evaluations out of 20):

if ($T < 8$ or $E < 8$) then $F = \min(0.2*P + 0.4*T + 0.4*E; 9)$

else $F = 0.2*P + 0.4*T + 0.4*E$