

Design of Manufacturing and Service Operations (E004701)

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

Offering	Language	Teaching Method	Hours
A (semester 2)	English	guided self-study	20.0 h
		seminar: coached	10.0 h
		exercises	
		lecture	10.0 h
B (semester 2)	Dutch	seminar	20.0 h
		guided self-study	20.0 h
		seminar: coached	10.0 h
		exercises	
		seminar	20.0 h

Lecturers in academic year 2018-2019

Gautama, Sidharta	TW18	lecturer-in-charge
Raa, Birger	TW18	co-lecturer

Offered in the following programmes in 2018-2019

Programme	crdts	offering
Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)	6	A
Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)	6	A
Master of Science in Electromechanical Engineering (main subject Maritime Engineering)	6	A
Master of Science in Electromechanical Engineering (main subject Mechanical Construction)	6	A
Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)	6	A
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
Master of Science in Sustainable Materials Engineering	6	A

Teaching languages

Dutch, English

Keywords

Facility design methods, production systems, service operations, lean manufacturing

Position of the course

In-depth study of the techniques to design operational systems and to evaluate them. Both manufacturing and service organisations are covered. This course contains a multidisciplinary project that combines various topics and competences from the IEOR master.

Contents

- Facilities Design: flow analysis, clustering material flows, cell design, manual and computer-based layout techniques
- In-plant logistics, line supply systems, parts picking
- Warehouse Design: manual and technological solutions for storage, material

- handling, and order picking, layout methods
- Design of service processes and facilities
- Lean Thinking in manufacturing and services

Initial competences

Know how to apply the concepts taught in the courses: 'Manufacturing Planning and Control', 'Methods Engineering and Work Measurement', 'Operations Research Models and Methods', 'Simulation of Manufacturing and Service Systems'.

Final competences

- 1 To be able to design operational systems; map, analyse and improve existing systems.
- 2 Make a design as a team, validate it and defend it before a jury.
- 3 Knowledge of formal calculation methods to analyze and organize material flow.
- 4 Independently acquire new knowledge and methods through a Blended Learning framework

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, seminar, seminar: coached exercises

Extra information on the teaching methods

Group work = integrating project to design the logistics of a manufacturing system in teams of 3 to 4 students.
Theoretical material will be offered as blended learning.

Learning materials and price

Course reader (10 euro).
Blended learning material on Minerva.

References

- Facilities Design (3rd edition), S. Heragu, 2008, CRC Press, 978-1-4200-626-5
- Warehouse and distribution science (Version 0.95), J. Bartholdi III, L. Hackman, 2011, Georgia Tech, www.warehouse-science.com
- Lean Production Simplified (2nd edition), P. Dennis, 2007, CRC Press, 978-1-56327-356-8
- Service Management, Fitzsimmons & Fitzsimmons, 2004, McGraw-Hill, 0-07-121457-7

Course content-related study coaching

Teachers are available during the project sessions and by appointment outside these hours.

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, oral examination, simulation, report

Examination methods in case of permanent evaluation

Oral examination, assignment, simulation, 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 exam with closed book.
During semester: graded team work based on written report and oral presentation and defense.
Students must pass **each exam part** on its own in order to pass in total for this course.

Calculation of the examination mark

Students must pass both exam parts **separately**. When one fails one part, only this one should be retaken in the second session.
End score when passed on both exam parts: Team work: 50%. Written exam score:

50%.

End score when failed on at least one part: Failed part: 99%. Other part: 1%.

Facilities for Working Students

Design project is allowed to be done individually.