GHENT UNIVERSITY

# Course Specifications

Valid in the academic year 2023-2024

## Manufacturing Planning and Control (E076221)

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

**Credits 6.0** **Study time 180 h**

**Course offerings and teaching methods in academic year 2023-2024**

| | | | | |
|---|---|---|---|---|
| A (semester 1) | English | Gent | lecture | |
| | | | practical | |
| | | | independent work | |
| | | | seminar | |
| B (semester 1) | Dutch | Gent | independent work | 0.0h |
| | | | seminar | 0.0h |
| | | | practical | 0.0h |

**Lecturers in academic year 2023-2024**

| | | |
|---|---|---|
| Raa, Birger | TW18 | lecturer-in-charge |

| **Offered in the following programmes in 2023-2024** | **crdts** | **offering** |
|---|---|---|
| Bridging Programme Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation) | 6 | A |
| Bridging Programme Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering) | 6 | A |
| Bridging Programme Master of Science in Industrial Engineering and Operations Research(main subject Manufacturing and Supply Chain Engineering) | 6 | A |
| Bridging Programme Master of Science in Electromechanical Engineering(main subject Maritime Engineering) | 6 | A |
| Bridging Programme Master of Science in Electromechanical Engineering(main subject Mechanical Construction) | 6 | A |
| Bridging Programme Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering) | 6 | A |
| Master of Science in Electrical Engineering (main subject Communication and Information Technology ) | 6 | A |
| Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation) | 6 | B |
| 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 | B |
| Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering) | 6 | A |
| Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems) | 6 | A |
| Master of Science in Industrial Engineering and Operations Research(main subject Manufacturing and Supply Chain Engineering) | 6 | A |
| Master of Science in Electromechanical Engineering(main subject Maritime Engineering) | 6 | B |
| Master of Science in Electromechanical Engineering(main subject Maritime Engineering) | 6 | A |
| Master of Science in Electromechanical Engineering(main subject Mechanical Construction) | 6 | B |
| Master of Science in Electromechanical Engineering(main subject Mechanical Construction) | 6 | A |
| Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering) | 6 | B |
| Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering) | 6 | A |
| Master of Science in Industrial Engineering and Operations Research(main subject | 6 | A |

| | | |
|---|---|---|
| Transport and Mobility Engineering) | | A |
| Master of Science in Biomedical Engineering | 6 | B |
| Master of Science in Biomedical Engineering | 6 | A |
| Master of Science in Chemical Engineering | 6 | A, B |
| Master of Science in Chemical Engineering | 6 | A |
| Master of Science in Civil Engineering | 6 | A |
| Master of Science in Computer Science Engineering | 6 | A |
| Master of Science in Industrial Design Engineering Technology | 6 | A |
| Master of Science in Industrial Engineering and Operations Research | 6 | B |
| Master of Science in Materials Engineering | 6 | A |
| Master of Science in Pharmaceutical Engineering | 6 | A |
| Master of Science in Photonics Engineering | 6 | A |
| Master of Science in Sustainable Materials Engineering | 6 | A |
| Postgraduate Programme in Innovation and Entrepreneurship in Engineering | 6 | A |
| Postgraduate Programme in Innovation and Entrepreneurship in Engineering – Advanced | 6 | A |
| Postgraduate Programme in Innovation and Entrepreneurship in Engineering – Foundations | 6 | A |

**Teaching languages**

English, Dutch

**Keywords**

operations management, production planning and control

**Position of the course**

The most important manufacturing planning and control methods are discussed in detail . The course contains mainly lectures, supplemented with some seminars by speakers from industry.

**Contents**

Manufacturing planning:
- 'Master Production Scheduling' and 'Sales and Operations Panning'
- MRP, MRP-II, ERP
- Scheduling
- Inventory management
- Forecasting

Shop floor control:
- Factory Physics
- Push vs. pull production activity control

Operations management:
- Manufacturing strategy
- Theory of Constraints
- Lean Manufacturing and Six Sigma

**Initial competences**

No prerequisites.

**Final competences**

1 indicate the strategic importance of production planning and control for a company
2 analyse and control complex production systems by using mathematical models
3 quantify the impact of variability on the performance of a production system
4 distinguish and correctly apply methods and tools for planning production and inventory at strategic, tactical and operational level
5 assess the usefulness of the different methods and tools for shop floor control in varying situations

**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**

Seminar, Lecture, Practical, Independent work

**Learning materials and price**

Lecture slides, exercises, case studies and background reading material are made available via the electronic learning environment.

**References**

- E.A. Silver, D.F. Pyke, D.J. Thomas (2017), "Inventory and Production Management in Supply Chains (4/e)", CRC Press, ISBN 978-1466558618 - available online via UGent Net.
- F.R. Jacobs, W. Berry, D. Whybark, T. Vollmann (2011), "Manufacturing Planning and Control for Supply Chain Management (6/e)", McGraw-Hill, ISBN 978-0071313933.
- W. Hopp, M. Spearman (2008), “Factory Physics (3/e)”, McGraw-Hill, ISBN 978-0071232463.
- J.R.T. Arnold, S.N. Chapman, L.M. Clive (2014), “Introduction to Materials Management (7/e)”, Pearson, ISBN: 978-1292021089.
- H. Lödding (2013), “Handbook of Manufacturing Control”, Springer, ISBN: 978-3642244575.

**Course content-related study coaching**

Teacher and assistants are available upon request.
Course material is available on the electronic learning environment.

**Assessment moments**

end-of-term assessment

**Examination methods in case of periodic assessment during the first examination period**

Written assessment

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

Written assessment

**Examination methods in case of permanent assessment**

**Possibilities of retake in case of permanent assessment**

not applicable

**Extra information on the examination methods**

Written exam with comprehensive questions and exercises

**Calculation of the examination mark**

50% of the final mark: comprehensive theory questions
50% of the final mark: exercises
A minimum score of 40% for both theory and exercises must be obtained in order to pass.

Final score F is determined as follows (with T score for theory out of 10, E score voor exercises out of 10):
if (T < 4 or E < 4) then F = min(T + E; 9)
else F = T + E