



university of
groningen

**Appendices to the Teaching and Examination
Regulations of the Master's degree programme in
Industrial Engineering and Management (2019-
2020)**



Appendix I Learning outcomes of the degree programme (art. 1.3)

After the master's degree programme Industrial Engineering and Management students have:

1. The knowledge to describe complex and advanced technological processes and products in a managerial/business context.
2. The understanding to diagnose the functionality and performance of such processes and products in a multi-disciplinary way (e.g. technological, managerial and from viewpoint of various stake-holders).
3. The skills to (re)design, implement and then evaluate such processes and products.
4. The knowledge, understanding and skills for doing research, i.e. applying industrial engineering methodologies in research.
5. The knowledge, understanding and skills for life-long learning (including information retrieval and ICT-use) needed to function autonomously.
6. The skills to think critically and communicate scientifically about ideas and solutions with engineers and managers.
7. The knowledge and understanding of advanced technology, managerial/business sciences and mathematics to do research and to enter a PhD-program in Industrial Engineering or a related discipline.
8. Professional skills for managerial, societal and ethical behaviour when applying technology.



Appendix II Specializations of the degree programme (art. 2.2)

The master's programme Industrial Engineering and Management contains two tracks:

- Production Technology and Logistics (PTL)
- Product and Process Technology (PPT)



Appendix III Content of the degree programme (art. 2.3)

Course unit	ECTS	Practical	Entry requirements
Core programme	75		
Technology Based Entrepreneurship	5	Yes	
Sustainability for Engineers	5	Yes	
Systems Engineering	5	Yes	
Master's Design Project IEM	25	Yes	- Research Methodology; - 45 ECTS of 1 st year Master's IEM programme must have been completed.
Master's Research Project IEM including Scientific Integrity module	30	Yes	- Research Methodology; - 45 ECTS of 1 st year Master's IEM programme must have been completed.
Research Methodology	5		
PTL-Track	45		
Foundations of Logistics Systems Engineering	5	Yes	
Simulation of Logistic Systems	5	Yes	
Robotics	5	Yes	
Surface Engineering & Coating Technology	5	Yes	
Analysis and Control of Smart Systems	5		
Optional Modules	20	Var	
PPT-track	45		
Interfacial Engineering	5		
Bio-based Products	5		
Polymer Products	5	Yes	
Advanced Product Engineering	5	Yes	
Optional Modules	20	Var	
Product Focused Process Design	5	Yes	



Appendix IV & V: Electives (art. 2.4) & Entry requirements and compulsory order of examinations (art. 3.4)

Within the PTL and PPT tracks of the IEM degree programme, there are 3 and 2 specializations, respectively.

The specializations of PTL are:

- Production Logistics Engineering (PLE)
- Advanced Production Engineering (APE)
- Smart Systems in Control and Automation (SSCA)

The specializations of PPT are:

- Chemical Engineering (CE)
- Biotechnology (BT)

Each of these specializations are characterized by their own specific optional technical modules, shown in the tables below. Each specialization consists of packages of optional technical modules for which a logical connection exists. All IEM students should choose at least 15 ECTS technical module(s) of their specialization. An exception to this is the BT specialization. Students in the BT specialization have to choose two courses from the BT specialization, and one course from the CE specialization.

The remaining choice (5 ECTS) can be made from optional technical modules of other specializations within the track. For type of examination, prerequisites, course format and other details, see <http://www.rug.nl/ocasys>.

Optional technical modules Production Logistics Engineering (PLE) (PTL)			
Course unit	ECTS	Practical	Entry requirements
Game Theory with Engineering Applications	5	Yes	
Distributed Optimization in Engineering Systems	5	Yes	
PLE3 (working title, title still to be determined)	5	Yes	

Optional technical modules Advanced Production Engineering (APE) (PTL)			
Course unit	ECTS	Practical	Entry requirements
Multi-scale Contact Mechanics & Tribology	5	Yes	
Product Design by the Finite Element Method	5	Yes	
Characterization of Materials	5	Yes	
Device Physics	5		
Mechanical Properties	5		
Numerical Mathematics I	5	Yes	
Compressible Flows	5	Yes	
CFD for Engineers	5	Yes	



Optional technical modules Advanced Production Engineering (SSCA) (PTL)			
Course unit	ECTS	Practical	Entry requirements
Fitting Dynamical Models to Data	5	Yes	
Modeling and Control of Complex Nonlinear Engineering Systems	5		
Advanced Digital and Hybrid Control Systems	5	Yes	
Mathematical Modelling	5		
Calculus of Variations and Optimal Control	5		
Numerical Mathematics I	5	Yes	
Compressible Flows	5	Yes	
CFD for Engineers	5	Yes	
Distributed Optimization in Engineering Systems	5	Yes	

Optional technical modules Chemical Engineering (CE) (PPT)			
Course unit	ECTS	Practical	Entry requirements
Catalysis for Engineers	5		
Food Pharma Products	5		
Particulate Products	5	Yes	
Advanced Polymer Processing	5		
Compressible Flows	5	Yes	
Design of Industrial Catalysts	5	Yes	
Advanced Process and Energy technologies	5		
CFD for Engineers	5	Yes	

Optional technical modules Biotechnology (BT) (PPT)			
Course unit	ECTS	Practical	Entry requirements
Bioprocess Technology	5	Yes	
Applied Biocatalysis and Bioconversion	5		



Appendix VI Admission to the degree programme and different tracks/specializations (art. 5.1.1 + art. 5.2)

- Holders of a Bachelor's degree in Industrial Engineering and Management from the University of Groningen. Admission is track specific.
- Holders of a Dutch or foreign Bachelor's or Master's degree with equivalent learning outcomes as the Bachelor's degree programme Industrial Engineering and Management of the University of Groningen.



Appendix VII Transitional provisions (art 7.1)

Discontinued course units				Substitute course units				
<i>Course unit code</i>	<i>Course unit name</i>	<i>EC TS</i>	<i>Final exam period</i>	<i>Course unit code</i>	<i>Course unit name</i>	<i>EC TS</i>	<i>Explanation</i>	<i>Equivalent Yes/No*</i>

There are no discontinued courses, so no transitional provisions.



Appendix VIII Application and decision deadlines for admission (art. 2.6.1 and 2.6.3)

Programmes starting on 1 September 2020 and 1 February 2021

Programme	Deadline of Application for 1 September	Deadline of decision for 1 September	Deadline of Application for 1 February	Deadline of decision for 1 February
Applied Mathematics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Applied Physics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Artificial Intelligence	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Astronomy	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Chemical Engineering	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Chemistry	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Computing Science	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Farmacie	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Industrial Engineering and Management	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Mathematics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Physics	1 May 2020	1 June 2020	15 October 2020	15 November 2020