

**Appendices to the Teaching and Examination  
Regulations of the Master's degree programme in  
Industrial Engineering and Management (2014-  
2015)**

## **Appendix I Teaching 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)
- Information Engineering (IE)
- Product and Process Technology (PPT)

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

Course unit	ECTS	Practical	Assessment form <sup>1)</sup>	Entry requirements <sup>2)</sup>
<b>Core programme</b>	<b>75</b>			
Entrepreneurship	5	Yes	WE/ASS	
Sustainability for Engineers	5	Yes	ASS	
Systems Engineering	5	Yes	ASS	
Design Project	25	Yes	ASS	
Master's thesis Research Project	30	Yes	ASS	- Research Methodology; - a minimal study-load of 45 ECTS within the IEM master's programme
Research Methodology	5	Yes	ASS	
<b>PTL-Specialization</b>	<b>45</b>			
Foundations of Logistics Systems Engineering	5	Yes	WE	
Simulation of Logistic Systems	5	Yes	ASS	
Robotics	5	Yes	WE	
Surface Engineering & Coating technology	5	Yes	WE/ASS	
Analysis and control of smart systems	5		WE	
Optional Modules	20	Var	Var	
<b>IE-Specialization</b>	<b>45</b>			
Distributed Systems	5	Yes	WE/ASS	
Software Architecture	5	Yes	ASS	
Business Intelligence	5	Yes	OE & ASS	
Sustainable and Integrated Information Systems	5	Yes	ASS	
Optional Modules	25	Var	Var	
<b>PPT-Specialization</b>	<b>45</b>			
Interfacial Engineering	5		WE	
Bio-based products	5		ASS	
Polymer Products	5	Yes	ASS	
Advanced product engineering	5	Yes	ASS	
Physical transport phenomena 2	5		WE	
Optional Modules	20	Var	Var	

<sup>1)</sup>WE: Written examination, OE: Oral examination, ASS: assignment including report and/or presentation, Var: various; <sup>2)</sup> entry requirements and compulsory order of examinations.

## **Appendix IV & V: Electives (art. 2.4) & Entry requirements and compulsory order of examinations (art. 3.2)**

Within the PTL and PPT tracks of the IEM degree programme, there are 3 and 2 specializations, respectively. The IE track does not have any further specialization.

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 technical modules, shown in the tables below.

All IEM students should choose at least three technical module(s) of their specialization. The remaining choice is free and can be made from technical modules of other specializations or from the list of Business/Management courses. For type of examination, prerequisites, course format and other details, see <http://www.rug.nl/ocasys>.

A list of optional modules of the IE track is also available in Ocasys.

<b>Specialization courses Production Logistics Engineering (PTL)</b>				
<b>Course unit</b>	<b>ECTS</b>	<b>Practical</b>	<b>Assessment</b>	<b>Entry requirements</b>
Planning and Scheduling Methods*	5			
Product & Service Development*	5			
Asset Management*	5			
Operations Management in Process Industry	5			

\* these courses are mandatory in this specialization

<b>Specialization courses Advanced Production Engineering (PTL)</b>				
<b>Course unit</b>	<b>ECTS</b>	<b>Practical</b>	<b>Assessment</b>	<b>Entry requirements</b>
Multi-scale Contact Mechanics & Tribology	5			
Product design by the finite element method	5			
Principles of Measurement	5			

Systems				
Characterization of Materials	5			
Solid Mechanics	5			
Device Physics	5			
Surfaces & Interfaces	5			

<b>Specialization courses Smart Systems in Control and Automation (PTL)</b>				
<b>Course unit</b>	<b>ECTS</b>	<b>Practical</b>	<b>Assessment</b>	<b>Entry requirements</b>
Fitting dynamical models to data	5			
Modeling and Control of Complex Nonlinear Engineering Systems	5			
Advanced Digital and Hybrid Control Systems	5			
Mathematical Modelling	5			
Calculus of Variations and Optimal Control	5			

<b>Specialization courses Chemical Engineering (PPT)</b>				
<b>Course unit</b>	<b>ECTS</b>	<b>Practical</b>	<b>Assessment</b>	<b>Entry requirements</b>
Process design	10			
Particulate Products	5			
Catalysis for Engineers	5			
Design of industrial catalysts	5			

<b>Specialization courses Biotechnology (PPT)</b>				
<b>Course unit</b>	<b>ECTS</b>	<b>Practical</b>	<b>Assessment</b>	<b>Entry requirements</b>
Bioprocess Technology	5			
Food Pharma products	5			
Applied Biocatalysis and Bioconversion	5			

**Appendix VI Admission to the degree programme and  
different specializations  
(art. 4.1.1 + art. 4.2)**

- Holders of a Bachelor's degree in Industrial Engineering and Management from the University of Groningen. Admission is profile 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

### Application deadlines for admission (art. 4.6.1)

<b>Deadline of Application</b>	<b>Non-EU students</b>	<b>EU students</b>
Nanoscience	February 1st 2015	May 1st 2015
Behavioural and Cognitive Neurosciences	April 1st 2015	May 1st 2015
Biomolecular Sciences (topprogramme)	April 1st 2015	April 1st 2015
Evolutionary Biology (topprogramme/EM)	January 15th 2015	January 15th 2015
Remaining FMNS Masters	May 1st 2015	May 1st 2015

### Decision deadlines (art. 4.6.3)

<b>Deadline of Decision</b>	<b>Non-EU students</b>	<b>EU students</b>
Nanoscience	June 1st 2015	June 1st 2015
Behavioural and Cognitive Neurosciences	June 1st 2015	June 1st 2015
Biomolecular Sciences (topprogramme)	June 1st 2015	June 1st 2015
Evolutionary Biology (topprogramme/EM)	June 1st 2015	June 1st 2015
Remaining FMNS Masters	November 1st 2015	November 1st 2015



faculty of mathematics and  
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