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Appendices to the Teaching and Examination Regulations of the Master's degree programme in Industrial Engineering and Management (2020-2021)

Appendix I Learning outcomes of the degree programme (art. 3.1)

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.

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Appendix II Tracks/Specializations of the degree programme (art. 3.5)

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

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

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

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

Appendix IV & V: Electives (art. 3.7) & Entry requirements and compulsory order of examinations (art. 4.4)

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 chosen 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**	**Parctical**	**Entry requirements**
Game Theory with Engineering Applications	5	See Ocasys	
Distributed Optimization in Engineering Systems	5	See Ocasys	
Introduction to Stochastic Programming	5	See Ocasys	
Data-driven Optimization	5	See Ocasys	

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

Compressible Flows	5	See Ocasys	
CFD for Engineers	5	See Ocasys	

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

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

Optional technical modules Biotechnology (BT) (PPT)			
Course unit	**ECTS**	**Course Code**	**Entry requirements**
Bioprocess Technology	5	See Ocasys	
Applied Biocatalysis and Bioconversion	5	See Ocasys	
Advanced Instrumentation and Analytics in Biotechnology	5	See Ocasys	

Appendix VI Admission to the degree programme and different tracks/specializations (art. 2.1.1 + art. 2.2)

- 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 7.2)

Discontinued course units				**Substitute course units**				
Course unit code	*Course unit name*	*ECTS*	*Final exam period*	*Course unit code*	*Course unit name*	*ECTS*	*Explanation*	*Equivalent Yes/No*
TBOM05E	Research Methodology	5	-	WMIE022-05	Research Methodology (and Scientific Integrity)	5	Mandatory Scientific Integrity lecture included in course.	Yes*
WMIE15000	Scientific Integrity	-	-	WMME004-00	Scientific Integrity (for ME)	-	IEM module is included in Research Methodology (and Scientific Integrity)	Yes*

*In 2020-2021, the Scientific Integrity module is part of the course Research Methodology (and Scientific Integrity) (WMIE022-05). Students that still need to follow Scientific Integrity (WMIE15000) but have passed the course Research Methodology (TBOM05E), can do so by enrolling in the Scientific Integrity (WMME004-00) module of the programme Mechanical Engineering. Students that have passed Scientific Integrity (WMIE15000) (registered P (V) in ProgressWWW) but still need to follow Research Methodology can participate in Research Methodology (and Scientific Integrity)) (WMIE022-05)and are excused from the mandatory lecture on Scientific Integrity.

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Appendix VIII

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

Programmes starting on 1 September 2020

Programme	Deadline of Application	Deadline of decision
Behavioural and Cognitive Neurosciences	1 May 2020	1 June 2020
Biology	1 May 2020	1 June 2020
Biomedical Engineering	1 May 2020	1 June 2020
Biomedical Sciences	1 May 2020	1 June 2020
Biomolecular Sciences	1 May 2020	1 June 2020
Ecology and Evolution	1 May 2020	1 June 2020
Energy and Environmental Sciences	1 May 2020	1 June 2020
Human-Machine Communication	1 May 2020	1 June 2020
Marine Biology	1 May 2020	1 June 2020
Mechanical Engineering	1 May 2020	1 June 2020
Medical Pharmaceutical Sciences	1 May 2020	1 June 2020
Nanoscience: for non-EU/EEA students	1 February 2020	1 June 2020
Nanoscience: for EU/EEA students	1 May 2020	1 June 2020
Science Education and Communication	1 May 2020	1 June 2020

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