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

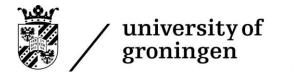




Appendix I Learning outcomes of the degree programme (art. 3.1)

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.



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)

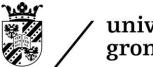




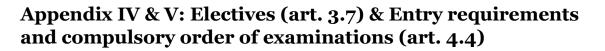
Appendix III Content of the degree programme (art. 2.3)

Course unit	ECTS	Practical	Entry requirements
	LCIS	Tactical	Entry requirements
Core programme	75		
Technology Based	5	See	
Entrepreneurship	0	Ocasys	
Sustainability for Engineers	5	See	
	Ū	Ocasys	
Systems Engineering	5	See	
	-	Ocasys	
Master's Design Project IEM	25	See	- Research Methodology
		Ocasys	(and Scientific Integrity);
			- 45 ECTS of 1 st year
			Master's IEM
			programme must have
			been completed.
Master's Research Project IEM	30	See	- Research Methodology
		Ocasys	(and Scientific Integrity);
			- 45 ECTS of 1 st year
			Master's IEM
			programme must have been completed.
Research Methodology (and	_	See	been completed.
Scientific Integrity)	5	Ocasys	
Scientific Integrity)		Ocasys	
PTL-Track	45		
Foundations of Logistics	5	See	
Systems Engineering		Ocasys	
Simulation of Logistic Systems	5	See	
Dahadian .	_	Ocasys	
Robotics	5	See	
Surface Engineering & Coating	_	Ocasys See	
Technology	5	Ocasys	
Analysis and Control of Smart		See	
Systems	5	Ocasys	
Optional Modules	20	See	
optional modules	20	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	





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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 <u>http://www.rug.nl/ocasys</u>.

Optional technical modules Production Logistics Engineering (PLE) (PTL)					
Course unit	ECTS	Parctical	Entry requirements		
Game Theory with Engineering	5	See			
Applications		Ocasys			
Distributed Optimization in	5	See			
Engineering Systems		Ocasys			
Introduction to Stochastic	5	See			
Programming		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 &	5	See			
Tribology		Ocasys			
Product Design by the Finite	5	See			
Element Method		Ocasys			
Characterization of Materials	5	See			
		Ocasys			
Device Physics	5	See			
		Ocasys			
Mechanical Properties	5	See			
		Ocasys			
Numerical Mathematics I	5	See			
		Ocasys			



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Compressible Flows5See
OcasysCFD for Engineers5See
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	5	See			
Nonlinear Engineering Systems		Ocasys			
Advanced Digital and Hybrid	5	See			
Control Systems		Ocasys			
Mathematical Modelling	5	See			
		Ocasys			
Calculus of Variations and Optimal	5	See			
Control		Ocasys			
Numerical Mathematics I	5	See			
		Ocasys			
Compressible Flows	5	See			
		Ocasys			
CFD for Engineers	5	See			
		Ocasys			
Distributed Optimization in	5	See			
Engineering Systems		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	5	See			
technologies		Ocasys			
CFD for Engineers	5	See			
-		Ocasys			



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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			

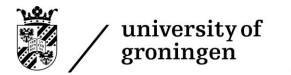


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Appendix VI Admission to the degree programme and different tracks/specializations (art. 2.1.1 + art. 2.2)

- 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)

Discontinue	d course uni	ts	1	Substitute	e course units	1		1
Course unit code	Course unit name	ECTS	Final exam period	Course unit code	Course unit name	ECTS	Explanation	Equivalent Yes/No
TBOM05E	Research Methodolo gy	5	-	WMIE02 2-05	Research Methodology (and Scientific Integrity)	5	Mandatory Scientific Integrity lecture included in course.	Yes*
WMIE15000	Scientific Integrity	-	-	WMME0 04-00	Scientific Integrity (for ME)	-	IEM module is included in Research Methodolo gy (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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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	1 May 2020	1 June 2020
Neurosciences		
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	Deadline of decision	Deadline of Application	Deadline of decision for 1
	for 1	for 1	for 1 February	February
	September	September		
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	1 May 2020	1 June 2020	15 October 2020	15 November 2020
and Management				
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