

# Study Programme

Academic year 2021-2022

Faculty of Engineering and Architecture

Master of Science in Industrial Engineering and Operations Research

Language of instruction: English

Programme version 9

1	Genera	Courses			32	credits
Nr	Course		CRDT	Ref MT1	Session	Study
1	E004255	Operations Research Models and Methods El-Houssaine Aghezzaf Department of Industrial Systems Engineering and Product Design	6	1	A:1	180
2	E005741	Simulation of Stochastic Systems Stijn De Vuyst Department of Industrial Systems Engineering and Product Design	6	1	A:1	180
3	E076950	Engineering Economy Sofie Verbrugge Department of Information Technology	4	1	A:1	120
4	E076340	Information Technology and Data Processing  Jan Aelterman Department of Telecommunications and Information Processing	6	1	B:2	180
5	E004241	Industrial Systems Modelling and Optimization El-Houssaine Aghezzaf Department of Industrial Systems Engineering and Product Design	6	2	A:1	180
6	E004152	Heuristics and Search Methods Sidharta Gautama Department of Industrial Systems Engineering and Product Design	4	2	A:1	120
2	Majors				30	credits
Sul	bscribe to 1	major from the following list. Subject to approval by the faculty.				
2.	1 Major I	Manufacturing & Supply Chain			30	credits
Nr	Course		CRDT	Ref MT1	Session	Study
1	E076221	Manufacturing Planning and Control  Birger Raa Department of Industrial Systems Engineering and Product Design	6	1	A:1	180
2	E076380	Methods Engineering and Work Measurement  Dieter Claeys Department of Industrial Systems Engineering and Product Design	6	1	A:1	180
3	E060240	Quality Engineering and Industrial Statistics Stijn De Vuyst Department of Industrial Systems Engineering and Product Design	6	1	A:2	180
4	E004701	Design of Manufacturing and Service Operations  Dieter Claeys Department of Industrial Systems Engineering and Product Design	6	1	A:2	180
5	E076251	Supply Chain Engineering Birger Raa Department of Industrial Systems Engineering and Product Design	6	2	A:1	180
2.2	2 Major <sup>-</sup>	Transport & Mobility			30	credits
Nr	Course		CRDT	Ref MT1	Session	Study
1	C004177	Spatiotemporal Analysis and Modelling Nico Van de Weghe Department of Geography	5	1	A:1	150
2	E084390	Traffic Flow Modelling  Dieter Fiems Department of Telecommunications and Information Processing	6	1	A:1	180
3	E084460	Design of Urban Services Sidharta Gautama Department of Industrial Systems Engineering and Product Design	6	1	A:2	180
4	C003534	Urban Mobility and Logistics Frank Witlox Department of Geography	5	2	A:1	150
5	E084470	Computational Aspects of Transport and Mobility  Pieter Audenaert Department of Information Technology	4	2	A:1	120
6	E084480	Advanced Topics in Traffic and Logistics Sidharta Gautama Department of Industrial Systems Engineering and Product Design	4	2	(A:2) <sup>c</sup>	120

3 Elective Courses 6 credits

Subscribe to no less than 6 credit units from the following list. Subject to approval by the faculty. Depending on the student's previous degree.

N			CRDT	Ref MT1	Session	Study
1	E018310	9	6	1	B:2	180
		Tom Dhaene Department of Information Technology				
2	E007120	Modelling and Control of Dynamic Systems [nl]	6	1	A:2	180
		Mia Loccufier Department of Electromechanical, Systems and Metal Engineering				

4 Elective Courses 28 credits

Subscribe to 28 credit units from 1 path from the following list. Subject to approval by the faculty.

- in year 1: 8 credits for major Manufacturing & Supply Chain; 15 credits for major Transport & Mobility
- in year 2: 20 credits for major Manufacturing & Supply Chain; 13 credits for major Transport & Mobility

#### 4.1 Elective Courses: Path 1

Subscribe to 28 credit units from no less than 1 and no more than 4 modules from the following list. Subject to approval by the faculty. Divided as:

- either 18 (to 22) credit units from the Minor Artificial Intelligence, with 10 (or 6) credit units from the other elective modules (4.1.1, 4.1.3 and/or 4.1.4)
- either at least 15 credit units from the elective list 4.1.1, with max. 13 credit units from the elective list 4.1.3 and/or max. 13 credit units from the elective module 4.1.4

## 4.1.1 Elective Courses Industrial Engineering and Operations Research

Nr Course		CRDT Ref	MT1 Session	Study
1 E003700	Game Theory with Engineering Applications  Heidi Steendam Department of Telecommunications and Information Processing	6	A:1	180
2 E007920	Computer Control of Industrial Processes Clara Ionescu Department of Electromechanical, Systems and Metal Engineering	6	A:1	180
3 E016330	Artificial Intelligence Aleksandra Pizurica Department of Telecommunications and Information Processing	6	A:1	180
4 E061330	Machine Learning  Joni Dambre Department of Electronics and Information Systems	6	B:1	180
5 E003421	Estimation and Decision Techniques  Hiep Luong Department of Telecommunications and Information Processing	4	A:1	120
6 E011610	Performance Analysis of Telecommunication Systems Sabine Wittevrongel Department of Telecommunications and Information Processing	4	A:1	120
7 E019331	ICT and Mechatronics Guillaume Crevecoeur Department of Electromechanical, Systems and Metal Engineering	6	A:2	180
8 E018210	Big Data Science Dieter De Witte Department of Electronics and Information Systems	6	A:2	180
9 E005220	Linear Systems Gert De Cooman Department of Electronics and Information Systems	6	A:2	180
10 E005722	Modelling and Simulation of Dynamical Systems  Guillaume Crevecoeur Department of Electromechanical, Systems and Metal Engineering	6	A:2	180
11 E004720	Network Modelling and Design  Mario Pickavet Department of Information Technology	4	B:2	120
12 E011320	Queueing Theory  Joris Walraevens Department of Telecommunications and Information Processing	6	B:1	180
13 E005770	Total Plant Automation  Johannes Cottyn Department of Industrial Systems Engineering and Product Design	6	A:2	180
14 E003110	Applied Probability [nl] Sabine Wittevrongel Department of Telecommunications and Information Processing	3	A:2	90
15 E076221	Manufacturing Planning and Control  Birger Raa Department of Industrial Systems Engineering and Product Design	6	A:1	180
16 E076380	Methods Engineering and Work Measurement  Dieter Claeys Department of Industrial Systems Engineering and Product Design	6	A:1	180
17 E060240	Quality Engineering and Industrial Statistics Stijn De Vuyst Department of Industrial Systems Engineering and Product Design	6	A:2	180

	Dieter Fiems Department of Telecommunications and Information Processing			
19 E084470	Computational Aspects of Transport and Mobility  Pieter Audenaert Department of Information Technology	4	A:1	120
4.1.2 Mino	r Artifical Intelligence			
	to less than 18 and no more than 22 credit units from the following list. Subject		Cassian	Ctudy
Nr Course 1 E016330	Artificial Intelligence Aleksandra Pizurica Department of Telecommunications and Information Processing	CRDT Ref MT1  6	Session A:1	Study 180
2 E061330	Machine Learning  Joni Dambre Department of Electronics and Information Systems	6	B:1	180
3 E018210	Big Data Science  Dieter De Witte Department of Electronics and Information Systems	6	A:2	180
4 E016340	Probabilistic Graphical Models  Aleksandra Pizurica Department of Telecommunications and Information Processing	4	A:2	120
5 F000918	Deep Learning  Joni Dambre Department of Electronics and Information Systems	6	A:2	180
4.1.3 Elect	ive Courses Industrial Engineering and Operations Research			
Nr Course		CRDT Ref MT1	Session	Study
1 E099920	International Internship 1 Patrick Segers Department of Electronics and Information Systems	3	B:2, A:1	90
2 E099930	International Internship 2 Patrick Segers Department of Electronics and Information Systems	3	B:2, A:1	90
3 E099940	International Internship 3 Patrick Segers Department of Electronics and Information Systems	6	B:2, A:1	180
4 E099960	Internship 1 [en, nl] Patrick Segers Department of Electronics and Information Systems	3	B:2, A:1	90
5 E099970	Internship 2 [en, nl] Patrick Segers Department of Electronics and Information Systems	3	B:2, A:1	90
6 E099980	Internship 3 [en, nl] Patrick Segers Department of Electronics and Information Systems	6	B:2, A:1	180
7 E065460	Rational Use of Materials  Tom Depover Department of Materials, Textiles and Chemical Engineering	5	A:1	150
8 E076820	Project Management  Mario Vanhoucke Department of Business Informatics and Operations Management	6	A:2	180
9 C003400	Bayesian Statistics Emmanuel Lesaffre Department of Mathematics, Computer Science and Statistics	5	A:2	150
10 E037810	Safety of Electrical and Mechanical Installations [nl]  Jos Knockaert Department of Electromechanical, Systems and Metal Engineering	3	A:2	90
11 E076320	The Information Society and ICT  Erik Mannens Department of Electronics and Information Systems	3	A:1	90
12 F000627	Transport Economics [nl]  Jochen Maes Department of Economics	6	A:2	180
13 F000892	Innovation Management  Katrien Verleye Department of Marketing, Innovation and Organisation	3	A:2	90
14 E076460	Dare to Venture  Johan Verrue Department of Marketing, Innovation and Organisation	4	A:2	120
15 F000224	Labour and Employment [nl] Stijn Baert Department of Economics	5	A:1	150
16 F000083	Macroeconomics [nl] Freddy Heylen Department of Economics	6	A:1	180
17 H001010	Introduction Industrial Psychology [nl]  Bart Wille Department of Developmental, Personality and Social Psychology	5	A:2	150
18 E076520	Commercial Law [nl] Diederik Bruloot Department of Interdisciplinary Study of Law, Private Law and Business Law	3	A:1	90
19 F000551	Business Skills Mieke Audenaert Department of Marketing, Innovation and Organisation	4	C:2	120
25-11-2025	18:42			р3

6

A:1

180

18 E084390 Traffic Flow Modelling

Dieter Fiems -- Department of Telecommunications and Information Processing

20 F000132	Corporate Finance Sophie Manigart Department of Accounting, Corporate Finance and Taxation	6		A:2	180
21 H001977	Coaching and Diversity [nl]  Elisabeth De Schauwer Department of Special Education	3	UKV	A:J	90
22 K001339	Sustainability Thinking [nl] Thomas Block Department of Political Sciences	5	UKV	A:J	150
23 E078010	Technology and Environment Luc Martens Department of Information Technology	3		A:1	90
24 A001900	Introduction to Psychology [nl] Wim Notebaert Department of Experimental Psychology	3		A:1	90
25 E076130	Introduction to Human Resource Management	3			90
26 D002354	Movement and Sports: Now and Later [nl]  Veerle Segers Department of Movement and Sports Sciences	3	UKV	A:2	90

### 4.1.4 Elective Courses Faculty

Subscribe to no more than 13 credit units of technical courses from the study programmes Master of Science in Engineering (with the exception of Architecture) of the Faculty of Engineering and Architecture. Subject to approval by the faculty.

### 4.2 Elective Courses: Path 2

Only available for students who follow the Major Manufacturing & Supply Chain. Subscribe to 28 credit units from 2 modules from the following list. Subject to approval by the faculty.

### 4.2.1 Minor Automotive Production Engineering

Subscribe to no less than 18 and no more than 24 credit units from the following list, with

- no less than 6 credit units from the courses with reference b,
- no less than 6 credit units from the courses with reference c.

Subject to approval by the faculty.

Only subscribe to courses with reference b or c.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E076221	Manufacturing Planning and Control  Birger Raa Department of Industrial Systems Engineering and Product Design	6	а		A:1	180
2	E076380	Methods Engineering and Work Measurement  Dieter Claeys Department of Industrial Systems Engineering and Product Design	6	а		A:1	180
3	E060240	Quality Engineering and Industrial Statistics Stijn De Vuyst Department of Industrial Systems Engineering and Product Design	6	а		A:2	180
4	E005770	Total Plant Automation  Johannes Cottyn Department of Industrial Systems Engineering and Product Design	6	а		A:2	180
5	E066661	Corrosion and Surface Technology Kim Verbeken Department of Materials, Textiles and Chemical Engineering	6	b		A:2	180
6	E066270	Metal Processing and Technology Roumen Petrov Department of Electromechanical, Systems and Metal Engineering	6	b		A:1	180
7	E900069	Composites Wim Van Paepegem Department of Materials, Textiles and Chemical Engineering	6	b		A:1	180
8	E043070	Materials Selection in Mechanical Design Stijn Hertelé Department of Electromechanical, Systems and Metal Engineering	6	b		B:2	180
9	E061322	Machine Design Dieter Fauconnier Department of Electromechanical, Systems and Metal Engineering	6	С		A:1	180
10	E037121	Displacement Pumps, Compressors and IC Engine Fundamentals Sebastian Verhelst Department of Electromechanical, Systems and Metal Engineering	6	С		A:1	180
11	E037221	IC Engines: advanced design and research Sebastian Verhelst Department of Electromechanical, Systems and Metal Engineering	3	С		A:2	90
12	E061621	Automotive Technology Toon Demeester Department of Electromechanical, Systems and Metal Engineering	3	С		A:2	90
13	E007920	Computer Control of Industrial Processes Clara Ionescu Department of Electromechanical, Systems and Metal Engineering	6	С		A:1	180
14	E008420	Servo Systems and Industrial Robots  Guillaume Crevecoeur Department of Electromechanical, Systems and Metal Engineering	3	С		A:1	90
15	E030520	Power Electronics Hendrik Vansompel Department of Electromechanical, Systems and Metal Engineering	3	С		A:2	90

# 4.2.2 Elective Courses Industrial Engineering and Operations Research

Subscribe to no less than 4 and no more than 10 credit units from the following list. Subject to approval by the faculty.

Nr Co	our <u>se</u>		CRDT Ref M	IT1 Session	Study
		Game Theory with Engineering Applications  Heidi Steendam Department of Telecommunications and Information Processing	6	A:1	180
2 E0	07920	Computer Control of Industrial Processes Clara Ionescu Department of Electromechanical, Systems and Metal Engineering	6	A:1	180
3 E0	16330	Artificial Intelligence Aleksandra Pizurica Department of Telecommunications and Information Processing	6	A:1	180
4 E0	61330	Machine Learning  Joni Dambre Department of Electronics and Information Systems	6	B:1	180
5 E0	03421	Estimation and Decision Techniques  Hiep Luong Department of Telecommunications and Information Processing	4	A:1	120
6 E0	11610	Performance Analysis of Telecommunication Systems Sabine Wittevrongel Department of Telecommunications and Information Processing	4	A:1	120
7 E0	19331	ICT and Mechatronics Guillaume Crevecoeur Department of Electromechanical, Systems and Metal Engineering	6	A:2	180
8 E0	18210	Big Data Science Dieter De Witte Department of Electronics and Information Systems	6	A:2	180
9 E0	05220	Linear Systems Gert De Cooman Department of Electronics and Information Systems	6	A:2	180
10 E0	05722	Modelling and Simulation of Dynamical Systems Guillaume Crevecoeur Department of Electromechanical, Systems and Metal Engineering	6	A:2	180
11 E0	04720	Network Modelling and Design  Mario Pickavet Department of Information Technology	4	B:2	120
12 E0	11320	Queueing Theory  Joris Walraevens Department of Telecommunications and Information Processing	6	B:1	180
13 E0	05770	Total Plant Automation  Johannes Cottyn Department of Industrial Systems Engineering and Product Design	6	A:2	180
14 E0	03110	Applied Probability [nl] Sabine Wittevrongel Department of Telecommunications and Information Processing	3	A:2	90
15 E0	76221	Manufacturing Planning and Control  Birger Raa Department of Industrial Systems Engineering and Product Design	6	A:1	180
16 E0	76380	Methods Engineering and Work Measurement  Dieter Claeys Department of Industrial Systems Engineering and Product Design	6	A:1	180
17 E0	60240	Quality Engineering and Industrial Statistics Stijn De Vuyst Department of Industrial Systems Engineering and Product Design	6	A:2	180
18 E0	84390	Traffic Flow Modelling  Dieter Fiems Department of Telecommunications and Information Processing	6	A:1	180
19 E0	84470	Computational Aspects of Transport and Mobility  Pieter Audenaert Department of Information Technology	4	A:1	120
5 Ma	aster's	S Dissertation		24	credits
Nr Co	urse		CRDT Ref M	IT1 Session	Study
1 E0	91103	Master's Dissertation	24	2 B:J	720

#### Teaching

When a course is not taught (solely) in the programme's language of instruction, the effectively used languages are indicated in square brackets following the cours name, using the following ISO codes:

bg: Bulgarian de: German es: Spanish ja: Japanese pl: Polish sh: Kroatian/Serbian zh: Chinese cs: Czech el: Greek fr: French nl: Dutch pt: Portuguese sl: Slovene

cs: Czech el: Greek fr: French nl: Dutch pt: Portuguese sl: Slovene da: Danish en: English it: Italian no: Norwegian ru: Russian sv: Swedish

#### Semester

Semesters are indicated by their number (1 or 2); semester 3 represents the summer period and J indicates a course spanning semesters 1 and 2. When a capital letter precedes a semester number, the course has multiple offerings. The letter indicates the offering concerned.

When a semester is shown in brackets, the course in not offered this year in the specific offering.

The offering frequency and first year of offering are indicated by the following codes:

a: bi-annually c: annually, from 2022-2023 f: annually, from 2023-2024 i: annually, from 2024-2025 g: bi-annually, from 2023-2024 g: bi-annually, from 2023-2024 pe: tri-annually, from 2022-2023 h: tri-annually, from 2023-2024 k: tri-annually, from 2024-2025