

MSc “People and Robots for Sustainable Work” programme

- Study plans –

This document presents the general syllabi of all the MSc double degrees available within the EIT Manufacturing “People and Robots for Sustainable Work” programme. Please note these are the basic versions of the study plans, in order to provide a better understanding of the programme and the differences among the several available combinations within the programme. Considering universities continuously develop their education offer, some of the courses could result to be updated, changed or replaced along the years. Once enrolled, the student will be supported by a local programme coordinator to define the final study plan accordingly to the general structure of the EIT Manufacturing Master programmes.

General structure of the EIT Manufacturing Master Programmes

Type of modules	Total credits for EIT-M Master	Total credits 1 st year	Total credits 2 nd year
Technical courses (TC)	45	40-50	10-20
Specialization courses (SC)	15		
Innovation & entrepreneurship courses (I&E)	30	10-20	10-20
Master thesis (MT)	30	0	30
Tot	120	60	60

Please scroll down this document to find the different syllabi.

People and Robots for Sustainable Work

- Study plan -

- SUPSI - TUWien collaboration -

General structure of the EITM Master Programme

Type of modules	Total credits for EIT-M Master	Total credits 1 st year	Total credits 2 nd year
Technical courses (TC)	45	40-50	10-20
Specialization courses (SC)	15		
Innovation & entrepreneurship courses (I&E)	30	10-20	10-20
Master thesis (MT)	30	0	30
Tot	120	60	60

Entry university SUPSI – exit university TUWien

1st year SUPSI

Draft plan:

Type of modules	SUPSI courses	ECTS	Semester	Total credits
TC	TSM Industrial control	3	2	33 (18 sem 1 15 sem 2)
	TSM PredContr: Model Predictive Control (ZH, Tue afternoon)	3	1	
	FTP OrdDiff: Ordinary Differential Equations and Dynamical Systems	3	1	
	FTP ModSim Modelling Simulation and Optimization	3	2	
	TSM IntAuto: Integrated Automation (ZH, Mon Afternoon)	3	2	
	FTP AppStat: Applied Statistics and Data Analysis	3	2	
	CM IntSust: Integrated Sustainable Management of Production Systems	3	1	
	FTP MultiASys: Multi-agent systems	3	2	
	PMS: Project on Human Robot collaboration*	9	1	
SC	PSM MS_AdvRob: Advanced robotics**	6	2	9

	TSM AdvRobot: Advanced Robotics (ZH, Tue morning)	3	1	(3 sem 1, 6 sem2)
I&E	CM InnoLEAN: Innovation and Lean	3	1	13
	PSM_ Project on Robotics and Automation*	10 (5+5)	1, 2	(8 sem1 5 sem2)

*PSM modules: they are example of possible individual projects to be included in this curriculum. Similar topics could be identified depending on the students' interest and opportunities in the university labs or companies collaborating with the university.

** Lab offered in Lugano to a class with group assignment

I&E	Centrally organized summer school	5	2	5 (5 sem 2)
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2nd year TUWien

Type of modules	TUWien courses	ECTS	Semester	Total credits
TC	330.265 Assistance Systems in Manufacturing 1	3	1 (WS)	12 (7 sem 1, 5 sem 2)
	330.273 Assistance Systems in Manufacturing 2	3	2 (SS)	
	307.490 Product Lifecycle Management (VO)	2	2 (SS)	
	330.289 Cobot Studio @Pilot Factory for Industry 4.0	2	1 (WS)	
	330.291 Digital Simulation of Ergonomics and Robotics (DSER)	2	1 (WS)	
SC	376.054 Machine Vision and Cognitive Robotics	6	1 (WS)	6 (6 sem1)
I&E	330.258 Innovation Theory	3	1 (WS)	12 (12 sem 1)
	NEW: Robot Challenge	9	1 (WS)	
MT	Master thesis: focus on People and Robots for Sustainable Work	30	2	30

Recap

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	18	15	7	5	45
SC	3	6	6		15
I&E	8	10	12		30
MT				30	30
Tot	29	31	25	35	120



People and Robots for Sustainable Work

- Study plan -

- MU – TU-Wien collaboration –

General structure of the EITM Master Programme

Type of modules	Total credits for EIT-M Master	Total credits 1 st year	Total credits 2 nd year
Technical courses (TC)	45	40-50	10-20
Specialization courses (SC)	15		
Innovation & Entrepreneurship courses (I&E)	30	10-20	10-20
Master thesis (MT)	30	0	30
Tot	120	60	60

Entry university MU – exit university TU-Wien

1st year MU

I&E: 18

TC: 42 (6 SP)

Draft plan:

Type of modules	MU courses	ECTS	Semester	Total credits
TC	MRB001 Data Analytics	3	1	30 ¹ (15 sem.1 15 sem.2)
	MRC001 Robotics: Mechanics, Modelling and Simulation ²	6	1	
	MRD001 Digital Control Systems	5	1	
	MRD002 Sensors and Measurements	3	1	
	MRE001 Artificial vision	4	1	
	MRA002 Electromechanical Drives	3	2	
	MRB002 Deep Learning	3	1	
	MRD004 Internet of Things Technologies	3	2	
	MRD005 Signal Processing	6	2	
SC	MRE002 Perception	6	2	12
	MRC002 Robot Programming	6	1	
	MRC003 Mobile Robotics	3	2	

¹ The real number of credits is 21 ECTS per semester but the integrated project activity takes 6 ECTS and therefore it is counted in the I&E module.

² There is an error in the webpage and the link is not working (see attached “MRC001-en. Robotics - mechanics, modelling and simulation.pdf” file for reference).



	MRC004 Robotic Control Systems	3	2	(6 sem.1 6 sem.2)
I&E	MRF001 Professional Placement I ³	3	1	18 (9 sem.1 9-12 sem.2)
	MEC101 Innovation management ⁴	3	1	
	MRF002 Professional Placement II ³	3	2	
	MED104 Alternative project management approaches ⁴	6	2	
	Integrated project activity ⁵	6 ⁶	1, 2	
I&E	Centrally organized summer school	5	2	5 (5 sem.2)

2nd year TU-Wien

I&E: 12

TC: 18 (9 SP)

MT: 30 ECTS

Type of modules	TU-Wien courses	ECTS	Semester	Total credits
TC	330.289 Cobot Studio @Pilot Factory for Industry 4.0	2	1	9 (7 sem.1 2 sem.2)
	307.440 Ecodesign, Sustainable Product Development	3	1	
	330.291 Digital Simulation of Ergonomics and Robotics (DSER)	2	1	
	307.490 Product Lifecycle Management (VO)	2	2	
SC	330.265 Assistance Systems in Manufacturing 1	3	1	6 (3 sem.1 3 sem.2)
	330.273 Assistance Systems in Manufacturing 2	3	2	
I&E	330.258 Innovation Theory	3	1	15 (9 sem.1 6 sem.2)
	330.287 Technology, Work and Organization	3	1	
	Robot Challenge ⁷	9	1, 2	

³ Limited number of available places (around 10 places available, changes year-to-year).

⁴ These subjects are proposed as alternatives for those cases where there are no available places in the Professional placement I and II courses.

⁵ There is no separate project course. The project is integrated into the other semester courses. All semesters in the university end up with a project where the students develop knowledge and know-how about robotics, innovation, and entrepreneurship concepts.

⁶ These credits are subtracted from the semester course credits and the students do not need to register or pay tuition fees for the integrated project activity. These credits must not be added to the total number of credits, but they compute as time dedicated to project development, innovation, and entrepreneurship.

⁷ This course is in the making. It will be designed by 2022. Goal: Design of a joint of a robot module.



MT	Master thesis: focus on People and Robots for Sustainable Work	30	1, 2	30 ⁸ (10 sem.1 20 sem.2)
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ECTS Summary by modules and semesters

Type of modules	1 st sem.	2 nd sem.	3 rd sem.	4 th sem.	Total credits
TC	15	15	7	2	39
SC	6	6	3	3	18
I&E	9	9	9	6	33
MT			10 ⁸	20 ⁸	30
TOTALS	30	30	29	31	120

⁸ The start of the master thesis is subject to change. Some of them start earlier and some of them start later.

People and Robots for Sustainable Work

- Study plan –

- MU – UTARTU collaboration–

General structure of the EITM Master Programme

Type of modules	Total credits for EIT-M Master	Total credits 1 st year	Total credits 2 nd year
Technical courses (TC)	45	40-50	10-20
Specialization courses (SC)	15		
Innovation & Entrepreneurship courses (I&E)	30	10-20	10-20
Master thesis (MT)	30	0	30
Tot	120	60	60

Entry university MU – exit university TARTU

1st year MU

I&E: 18

TC: 42 (6 SP)

Draft plan:

Type of modules	MU courses	ECTS	Semester	Total credits
TC	MRB001 Data Analytics	3	1	30 ¹ (15 S1, 15 S2)
	MRC001 Robotics: Mechanics, Modelling and Simulation ²	6	1	
	MRD001 Digital Control Systems	5	1	
	MRD002 Sensors and Measurements	3	1	
	MRE001 Artificial vision	4	1	
	MRA002 Electromechanical Drives	3	2	
	MRB002 Deep Learning	3	1	
	MRD004 Internet of Things Technologies	3	2	
	MRD005 Signal Processing	6	2	
	MRE002 Perception	6	2	
SC	MRC002 Robot Programming	6	1	12 (6 S1, 6 S2)
	MRC003 Mobile Robotics	3	2	
	MRC004 Robotic Control Systems	3	2	
I&E	MRF001 Professional Placement I ³	3	1	18

¹ The real number of credits is 21 ECTS per semester but the integrated project activity takes 6 ECTS and therefore it is counted in the I&E module.

² There is an error in the webpage and the link is not working (see attached “MRC001-en. Robotics - mechanics, modelling and simulation.pdf” file for reference).

³ Limited number of available places (around 2-3 places available, changes year-to-year).

	MEC101 Innovation management ⁴	6	1	(9-12 S1, 6-9 S2)
	MRF002 Professional Placement II ³	3	2	
	Integrated project activity ⁵	6 ⁶	1, 2	

⁴ These subjects are proposed as alternatives for those cases where there are no available places in the Professional placement I and II courses. In this case, they get 12 ECTS in S1 and 6 ECTS in S2.

⁵ There is no separate project course. The project is integrated into the other semester courses. All semesters in the university end up with a project where the students develop knowledge and know-how about robotics, innovation, and entrepreneurship concepts.

⁶ These credits are subtracted from the semester course credits and the students do not need to register or pay tuition fees for the integrated project activity. These credits must not be added to the total number of credits, but they compute as time dedicated to project development, innovation, and entrepreneurship.

2nd year UTARTU

I&E: 12

TC: 18 (9 SP)

MT: 30 ECTS

Type of modules	UTARTU courses (track B)	ECTS	Semester	Total credits
TC + SC	Students can choose courses in the amount of 24 ECTS in lieu of professional practice. List of courses: https://ois2.ut.ee/#/curricula/136637/version/2021/details	18	1	18 (18 S1)
I&E	Centrally organized summer school ⁷	5	1	12 (7 from courses + 5 from summer school) (7-12 S1)
	Students have to choose courses for at least 7 ECTS to comply with EIT Innovation and Entrepreneurship requirements from the list of courses from 4.2 Management Module and 4.3 Economy Module: https://ois2.ut.ee/#/curricula/136637/version/2021/details Some proposed subjects ⁸ :			
	Marketing	5	1	
	Business Process Management	6	1	
	Principles of Management	6	1	
MT	Master thesis: focus on People and Robots for Sustainable Work	30	2	30 (30 S2)

<https://ois2.ut.ee/#/curricula/136637/version/2021/details>

<https://www.mondragon.edu/en/master-degree-robotics-control-systems/study-programme>

ECTS Summary by modules and semesters

Type of modules	1 st sem.	2 nd sem.	3 rd sem.	4 th sem.	Total credits
TC	15	15	12		42
SC	6	6	6		18
I&E	9-12	6-9	12		30
MT				30	30
TOTALS	30-33*	30 - 27*	30	30	120

* The workload per semester depends on the student's individual choice of elective courses.

⁷ The centrally organised summer school takes place in July of the 1st year. However, the credits are computer in the I&E courses of the exit university.

⁸ 7 ECTS I&E are required because the Summer School 5 ECTS are computed in the second year.