MSc “Additive Manufacturing for a full flexibility” programme

- Study plans –

This document presents the general syllabi of all the MSc double degrees available within the EIT Manufacturing “Additive Manufacturing for a full flexibility” 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 EITM Master Programme

Type of modules	Total credits for EIT-M Master	Total credits 1st year	Total credits 2nd 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 of the following available combinations.

Available entry and exit combinations from November 2023 on:

ENTRY university	EXIT university
Aalto University (Aalto)	TU Wien
SUPSI	TU Wien
University College Dublin (UCD)	Aalto University (Aalto)
University College Dublin (UCD)	SUPSI
University College Dublin (UCD)	TU Wien

- Additive Manufacturing for a full flexibility

- Study plan –

- Aalto - TUWien collaboration–

Entry university Aalto – exit university TUWien

1st Entry year Aalto 2024-2025 or 2025-2026

Note: The course list below belongs to Curriculum 2022-2024. Aalto curriculum is renewed biannually. The new curriculum will be published in April 2024 at https://www.aalto.fi/en/programmes/masters-programme-in-manufacturing/curriculum-2024-2026. Minor changes are likely to occur.

Local up-to-date webpages for entry/exit university courses
Additive Manufacturing for Full Flexibility (EIT), Master of Science (Technology) | Aalto University

Type of modules	Course code and name at Aalto	ECTS	Semes-ter	Total credits
	Compulsory courses			
TC	MEC-E1003 Machine Design Project	5	1	10 ECTS
	MEC-E1080 Production Engineering	5	1	
SC	MEC-E7006 Advanced Manufacturing	5	2	10 ECTS
	MEC-E7009 Design for Additive Manufacturing	5	2	
	Elective courses (select 25 ECTS)			25 ECTS
	MEC-E1090 Quality Management and Metrology	5	1	
	MEC-E6002 Welding Technology and Design	5	2	
	MEC-E7001 Production Systems Modeling	5	2	
	MEC-E7002 Manufacturing Methods I	5	2	
	MEC-E7003 Manufacturing Methods II	5	2	
	MEC-E7005 Advanced Casting Technology	5	2	
	ELEC-E8113 Information Systems in Industry	5	1	
I&E	TU-E4100 Startup Experience D	9	2	15 ECTS
	LC-1317 Integrated Project Communication for MSc Students (o,w) **	3	2	
	Elective courses (choose 3 ECTS)			
	TU-E4300 Introduction to Digital Business and Venturing D	3	1	
	TU-C2080 Entrepreneurship Essentials *	1	1	
	TU-C2090 Starting Up *	2	1	
	MNGT-C1005 Finland works	2	1	

*) Online self-study courses that can be completed in any period / term, but we recommend these in the autumn term to secure sufficient background knowledge for Startup Experience in the spring.

**) Integrated with Startup Experience; cannot be completed as a stand-alone course. This course is not mandatory for students who have completed a bachelor degree in Finland. The course fulfills the requirements of compulsory foreign language course in the degree. If you don't take this course, pick another eligible language course either in the autumn or in the spring term. Registration is required separately to both Startup Experience and Integrated Project Communication course.

2nd Exit year at TUWien 2023-2024, 2024-2025, 2025-2026

Local up-to-date webpages for entry/exit university courses
Curriculum 066 517 Master programme Manufacturing and Robotics | TU Wien

Note: The course list below is from the 2022-2024 curriculum. The curriculum of the TU Vienna is constantly evolving. Therefore, minor changes in the study plan may occur due to discontinued or newly added courses.

Type of modules	TUWien courses	ECTS	Semes-ter	Total credits
TC	*Elective courses TC (minimum 12 ECTS)*			min. 12 ECTS
	311.136 Basics of Laser Technology	3	1 (WS)	
	317.540 Isogeometric Analysis	5	2 (SS)	
	317.554 Composites Engineering	3	1 (WS)	
	317.552 Lightweight Design with Fibre Reinforced-Polymers	4	1 (WS)	
	308.868 Engineering Materials	2	1 (WS)	
	311.170 Mechanical behaviour of 3D printed components: Opportunities and challenges in future design	2	1 (WS)	
SC	*Elective courses SC (minimum 5 ECTS)*			min. 5 ECTS
	308.865 Additive Manufacturing Technologies	2	2 (SS)	
	308.106 Biocompatible Materials	3	1 (WS)	
	311.125 Precision Machining with Lasers	3	1 (WS)	
	311.063 Co-ordinate measuring machine	2	1 (WS)	
	325.112 Robot Control	3	2 (SS)	
	311.745 Intelligent Manufacturing Systems	3	2 (SS)	
	328.011 Digital Control	3	2 (SS)	
	311.189 Programming and Simulation of Machining Systems (CAD/CAM)	3	1 (WS)	
I&E	*Compulsory courses I&E*			min. 13 ECTS
	Centrally organized summer school	5		
	Elective courses I&E (minimum 8 ECTS)			
	330.258 Innovation Theory	3	1 (WS)	
	164.287 European Union - Institutions, Policies and Future Challenges	2	1 (WS)	
	307.440 Ecodesign, Sustainable Product Development	3	1 (WS)	
	330.287 Technology, Work and Organization	3	1 (WS)	
	015.100 Creativity Engineering	3	1 (WS)	

	330.124 Project and Enterprise Financing	3	2 (SS)	
	330.255 E&I Garage - Business Model Development	5	2 (SS)	
	330.230 Entrepreneurship and Innovation	3	2 (SS)	
	015.664 Entrepreneurship	3	2 (SS)	
MT	Master thesis: Focus on Additive Manufacturing for full flexibility	30	2 (SS)	30

Recap

Type of modules	ECTS in S1*	ECTS in S2*	ECTS in S3	ECTS in S4	Total credits
TC	5 – 33	10 – 38	min. 12		**45**
SC			min. 5		**15**
I&E	6 – 15	5 – 14	13	0	**30**
MT				30	**30**
Tot	11 – 48	15 - 52	23	37	**120**

*The thesis is completed in an industrial setting and must be approved by both entry and exit university.

- Additive Manufacturing for Full Flexibility

- Study plan –

- SUPSI - TUWien collaboration–

Entry university SUPSI – exit university TUWien

1st year SUPSI

Local up-to-date webpages for entry/exit university courses:
Master of Science in Engineering - Mechatronics & Automation - SUPSI

Type of modules	SUPSI courses	ECTS	Semes-ter	Total credits
TC	TSM_Materials Selection and Design	3	1	33 (9 sem 1 24 sem 2)
	FTP_OrdDiff: Ordinary Differential Equations and Dynamical Systems	3	1	
	FTP_ModSim Modelling Simulation and Optimization	3	2	
	TSM_CSM: Computational Structural Mechanics (ZH, Mon Morning)	3	2	
	TSM_AdvMech: Advanced Structural Mechanics (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	
	MP_CAE: Computer Aided engineering**	9	2	
SC	MS_TPEMAM: Seminar – Technologies, Processes and Equipment for Metal based Additive Manufacturing**	7 (4+3)	1,2	10 (7 sem1, 3 sem2)
	TSM_Structural and Vibration	3	1	
I&E	CM_InnoLEAN: Innovation and Lean	3	1	12 (12 sem1)
	PSM Project on Additive Manufacturing*	9	1	

*PMS module: this is an example of possible individual project 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 for a class of students with group assignments

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

2nd year TUWien

Local up-to-date webpages for entry/exit university courses:
Curriculum 066 517 Master programme Manufacturing and Robotics | TU Wien

Type of modules	TUWien courses	ECTS	Semes-ter	Total credits
TC	311.136 Basics of Laser Technology	3	1 (WS)	12 (7 sem1, 5 sem2)
	317.540 Isogeometric Analysis	5	2 (SS)	
	317.508 Composites Engineering	4	1 (WS)	
SC	308.865 Additive Manufacturing Technologies	2	2 (SS)	5 (3 sem1, 2 sem2)
	308.106 Biocompatible Materials	3	1 (WS)	
I&E	330.258 Innovation Theory	3	1 (WS)	13 (13 sem1, 0 sem2)
	164.287 European Union - Institutions, Policies and Future Challenges	2	1 (WS)	
	330.261 End-of-Life Management	3	1 (WS)	
	330.287 Technology, Work and Organization	3	1 (WS)	
	311.170 Mechanical behaviour of 3D printed components: Opportunities and challenges in future design	2	1 (WS)	
MT	Master thesis: Focus on Additive Manufacturing for full flexibility	30	2 (SS)	30

Recap

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	9	24	7	5	**45**
SC	7	3	3	2	**15**
I&E	12	5	13	0	**30**
MT				30	**30**
Tot	28	32	23	37	**120**

Additive Manufacturing for Full Flexibility

- Study plan –

UCD - Aalto collaboration

Entry university UCD– exit university Aalto

1st year UCD

Local up-to-date webpages for entry/exit university courses
ME Manufacturing Engineering with Add Manufacturing for Full Flex - Programme Details (ucd.ie)

Draft plan

Type of modules	UCD courses	ECTS	Semes-ter	Total credits
TC	Computational Continuum Mechanics II	5	1	30
	Data Analytics for Engineers	5	1	
	Computational Continuum Mechanics I	5	1	
	Materials Thermodynamics and Kinetics (option) Sys. Anal. & Improv. (EITM) (option)	5	1	
	Advanced Metals Processing	5	2	
	Operations Management	5	2	
SC	Manufacturing Engineering II	5	1	10
	Advanced Polymer Engineering	5	2	
I&E	CBE Business Plan	5	2	20
	Technical Communication (option) Research Skills and Techniques (option)	5	1	
	Professional Eng. (Finance)	5	2	
	Professional Engineering (Management)	5	2	

2nd year Aalto (academic year 2024-2025 or 2025-2026)

Note: The course list below belongs to Curriculum 2022-2024. Aalto curriculum is renewed biannually. The new curriculum will be published in April 2024 at https://www.aalto.fi/en/programmes/masters-programme-in-manufacturing/curriculum-2024-2026. Minor changes are likely to occur.

In addition, the local up-to-date webpages for entry/exit university courses
Additive Manufacturing for Full Flexibility (EIT), Master of Science (Technology) | Aalto University

Type of modules	Aalto courses	ECTS	Semes-ter	Total credits

TC	*Choose 10 ECTS of the following:*			10
	MEC-E1080 Production Engineering	5	3	
	MEC-E1003 Machine Design Project	4	3	
	MEC-E1060 Machine Design	5	3	
	MEC-E1070 Selection of Engineering Materials	5	3	
SC	MEC-E1090 Quality Management and Metrology	5	3	5
I&E	Centrally organized Summer School	5	summer	5
	TU-E4100 Startup Experience	9	3	9
	Choose 0-2 of the following to achieve total 30 ECTS for degree I&E minor:			
	TU-C2080 Entrepreneurship Essentials	1		1
	MNGT-C1005 Finland works	2		
Other	LC-XXXX Compulsory foreign language course	3	3	
MT	Master thesis	30	4	30

Recap

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	20	10	10		**45**
SC	5	5	5		**15**
I&E	5	15	10+5		**30**
MT				30	
English			3		**3**
	30	30		63	**120+3**

Additive Manufacturing for Full Flexibility

- Study plan –

UCD - TUW collaboration

Entry university UCD – exit university TUW

1st year UCD

Local up-to-date webpages for entry/exit university courses
ME Manufacturing Engineering with Add Manufacturing for Full Flex - Programme Details (ucd.ie)

Type of modules	UCD courses	ECTS	Semes-ter	Total credits
TC	Computational Continuum Mechanics II	5	1	30
	Data Analytics for Engineers	5	1	
	Computational Continuum Mechanics I	5	1	
	Materials Thermodynamics and Kinetics (option) Sys. Anal. & Improv. (EITM) (option)	5	1	
	Advanced Metals Processing	5	2	
	Operations Management	5	2	
SC	Manufacturing Engineering II	5	1	10
	Advanced Polymer Engineering	5	2	
I&E	CBE Business Plan	5	2	20
	Technical Communication (option) Research Skills and Techniques (option)	5	1	
	Professional Eng. (Finance)	5	2	
	Professional Engineering (Management)	5	2	

2nd year TUW

Local up-to-date webpages for entry/exit university courses
Curriculum 066 517 Master programme Manufacturing and Robotics | TU Wien

Type of modules	TUW courses	ECTS	Semes-ter	Total credits
TC	311.136 Basics of Laser Technology	3	1 (WS)	9 (9 sem1)
	311.170 Mechanical behaviour of 3D printed components: Opportunities and challenges in future design	2	1 (WS)	

	317.508 Composites Engineering	4	1 (WS)	
SC	308.865 Additive Manufacturing Technologies	2	2 (SS)	5 (3 sem1, 2 sem2)
	308.106 Biocompatible Materials	3	1 (WS)	
I&E	330.258 Innovation Theory	3	1 (WS)	11 (13 sem1)
	164.287 European Union - Institutions, Policies and Future Challenges	2	1 (WS)	
	330.261 End-of-Life Management	3	1 (WS)	
	330.287 Technology, Work and Organization	3	1 (WS)	
I&E	Centrally organized summer school	5	1 (SS)	5 (5 sem 1)
MT	Master thesis: Focus on Additive Manufacturing for full flexibility	30	2	30 (30 sem2)

Recap

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	20	10	9	0	**39**
SC	5	5	3	2	**15**
I&E	5	15	16	0	**36**
MT				30	**30**
Tot	30	30	28	32	**120**

Additive Manufacturing for Full Flexibility

- Study plan –

UCD - SUPSI collaboration

Entry university UCD – exit university SUPSI

1st year UCD

Local up-to-date webpages for entry/exit university courses:
ME Manufacturing Engineering with Add Manufacturing for Full Flex - Programme Details (ucd.ie)

Type of modules	UCD courses	ECTS	Semes-ter	Total credits
TC	Computational Continuum Mechanics II	5	1	30
	Data Analytics for Engineers	5	1	
	Computational Continuum Mechanics I	5	1	
	Materials Thermodynamics and Kinetics (option) Sys. Anal. & Improv. (EITM) (option)	5	1	
	Advanced Metals Processing	5	2	
	Operations Management	5	2	
SC	Manufacturing Engineering II	5	1	10
	Advanced Polymer Engineering	5	2	
I&E	CBE Business Plan	5	2	20
	Technical Communication (option) Innovation Leadership (option) Research Skills and Techniques (option)	5	1	
	Professional Eng. (Finance)	5	2	
	Professional Engineering (Management)	5	2	

2nd year SUPSI

Local up-to-date webpages for entry/exit university courses
Master of Science in Engineering - Mechatronics & Automation - SUPSI

Type of modules	SUPSI courses	ECTS	Semes-ter	Total credits
TC	FTP_PredMod_Predictive_Modelling_(ZH,_Wed afternoon)	3	1	9
	FTP_OrdDiff: Ordinary Differential Equations and Dynamical Systems	3	1	

	FTP_ModSim Modelling Simulation and Optimization	3	2	
SC	MS_TPEMAM: Seminar – Technologies, Processes and Equipment for Metal based Additive Manufacturing**	4	1	7
	TSM_Structural and Vibration	3	1	
I&E	CM_InnoLEAN: Innovation and Lean	3	1	14
	CM_InnChang: Innovation and Change Management (ZH, Wed evening)	3	1	
	CM_QRM: Quality and Risks management	3	2	
	Centrally organized summer school	5	1	
MT	Master thesis: Focus on Additive Manufacturing for full flexibility	30	2	30

Recap

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	20	10	6	3	**39**
SC	5	5	7	0	**17**
I&E	5	15	11	3	**34**
MT				30	**30**
Tot	30	30	24	36	**120**