Additive Manufacturing for Full Flexibility

Master Science programme

General. Basic information

Name & type	MSc Additive Manufacturing for Full Flexibility
Mode & duration	full-time, 2 years Credits: 120 ECTS
Accreditation	EIT Label accreditation - November 2020
Annual Tuition fee	EU/EFTA students tuition fee: EUR 8000.00 per year NON EU/EFTA students tuition fee: EUR 15000.00 per year Students financial support is provided to a sub-set of enrolled students. No specific request is needed. Available financial support is: * based on merit

EIT Manufacturing Master School

'Join the force of Innovation in Manufacturing'

The **EIT Manufacturing Master School** offers two-year programmes that encompasses a year of intensive study at two different universities, where students acquire comprehensive knowledge and expertise in their chosen field. Additionally, the **programme includes a three-week summer school** emphasizing

a minor track in **Innovation & Entrepreneurship** held at a third university, enriching the learning experience further.

This initiative is a collaborative effort led by EIT Manufacturing, in association with **seven university partners**. Together, we have designed and implemented five diverse programmes that merge technical and technological coursework with specialized training in innovation and entrepreneurship. These programmes provide students with a multifaceted education that not only equips them with a strong academic foundation but also **fosters the development of practical skills** necessary for success in the dynamic and evolving landscape of manufacturing. The education at EITM Manufacturing Master School combines technical competencies with skills in Innovation and Entrepreneurship. EIT Manufacturing Master School students will be an elite group of forthcoming engineers, operators, innovators, and other relevant professionals.

Programme Overview

The Additive Manufacturing for Full Flexibility (AM) programme is one of the Master of Science level programme within the EIT Manufacturing (EITM) Master School.

The EITM Master School students will:

- Improve their knowledge on up-to-date manufacturing innovation and learn
- how to turn this knowledge into successful business;
- Take part in events such as Summer Schools and Kick-offs;
- Exchange ideas with business partners and researchers at Co-Locations Centres (CLC) and during internships;
- have access to renowned European research facilities;
- earn double degree and the EIT Manufacturing Certificate.

Additive Manufacturing for Full Flexibility (AM) is a combination of studying manufacturing science including physics of additive manufacturing processes, mechanical design including exploiting the design freedoms enabled for more customized products and services, and production management

including the flexibility enabled for smaller lot production. During the programme students will gain new skills in these areas.

In manufacturing science, relevant fields include molten material physics, heat transfer, and deformation.

In design engineering, relevant fields are numerical and topological optimization, process physics simulation, new concept generation and design engineering.

In production management, relevant fields include logistics, digitalization and quality.

Students learn the latest theoretical knowledge and know how to apply their skills in practical real-life problems. Typical application areas of AM include rapid prototyping, flexible pattern and mold manufacturing, lightweight systems, and flexible manufacturing systems.

Programme structure

The first year is spent at one university (entry) and second year at another (exit) university in two different European countries. The combination of entry and exit university are called student study path.

The following universities provide an **entry year (first year)**:

- Aalto University (Aalto), Finland
- University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland
- University College Dublin (UCD), Ireland

The following parties provide an **exit year (second year)**:

- Aalto University (Aalto), Finland
- Technische Universität Wien (TU Wien), Austria
- University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland

Possible combinations:

Combination	ENTRY University (YEAR 1)	EXIT University (YEAR 2)
Combination 1	Aalto University (Finland)	TU Wien (Austria)
Combination 2	SUPSI (Switzerland)	TU Wien (Austria)
Combination 3	UCD (Ireland)	Aalto University (Finland)
Combination 4	UCD (Ireland)	TU Wien (Austria)
Combination 5	UCD (Ireland)	SUPSI (Switzerland)

EIT Manufacturing reserves the right to change the exit universities of this programme

Curricula structure:

The two years programme (120 ECTS) includes an Innovation and Entrepreneurship (I&E) Module (30 ECTS) and a Technical Major Module (90 ECTS) structured as follows:

- 45 ECTS for Host Programme technical courses
- 15 ECTS for Host Programme AM specialization courses
- 30 ECTS for the I&E Module courses
- 30 ECTS for the Master thesis

Students are committed to collect a total of 40-50 ECTS related to the Technical Major and of 10-20 ECTS related to the I&E Module in the first year (60 ECTS total) whereas in the second year they are committed to collect 10-20 ECTS for the Technical Major, 10-20 ECTS for the I&E Module and 30 ECTS for the Master Thesis Project (60 ECTS total). The total of technical courses and specialization courses must be 60 ECTS, within the boundaries above. All Master School education will be held in English and all partner universities are assumed to use ECTS units.

NOTE: Each university can have, in addition to the general programme above, compulsory requirements for the student study plan, such as mandatory local language courses. You will be informed by your university about this.

DEGREES and EIT Label Certificate:

At the end of the EIT Manufacturing Additive Manufacturing for Full Flexibility (AM) programme of 120 ECTS, students will get two degrees from each entry and exit university, according to the following list:

- **Aalto:** Diplomi-insinööri, Diplomingenjör, Master of Science (Technology), Decree of the Council of State on University Degrees (1136/2009) – 120 ECTS degree
- **SUPSI:** Master of Science (MS) in Engineering, University of Applied Sciences and Arts of southern Switzerland (SUPSI) – 90 ECTS degree
- **TU Wien:** Diplom-Ingenieur (equivalent to Master of Science) in Mechanical Engineering – 120 ECTS degree
- **UCD:** ME Manufacturing Engineering with Additive Manufacturing for Full Flexibility – 120 ECTS degree

In addition to the National Accredited degrees, the students receive the **EIT Label Certificate**, documenting the EIT accreditation and high quality of the programme.

Career opportunities:

The EIT Manufacturing Master School will prepare you for high level technical positions, Innovation roles and business profiles, including the capability to create your own start-up and you will be provided the needed skills to create a start-up and work on your innovative idea. In addition, you will be provided the needed skills to create a start-up and work on your innovative idea It will allow you to create a professional network at national and international level through the several initiatives and the EIT Alumni communities.

The degrees also grant you the eligibility (120 ECTS degrees only) for post graduate doctoral studies, eventually to be done at "EIT Manufacturing Doctoral School.":https://eitmanufacturing.eu/activities/eit-manufacturing-doctoral-school/

A student who graduates from the Additive Manufacturing for Full Flexibility (AM) shall:

- have broad knowledge of theories and concepts in additive manufacturing disciplinary foundations, proven experience in working with methodological knowledge in manufacturing challenges, and a considerable degree of specialized knowledge of multidisciplinary decision support systems for manufacturing.
- be able to critically, independently and creatively participate in strategic work to meet manufacturing-related problems and to be able to relate these measures to sustainable social development,
- be able to implement the gained engineering expertise in AM to create new or improved methods, techniques, products, and services in the field;
- be able to think beyond traditional disciplinary boundaries to find innovative solutions to real-world problems and to come up with new ideas;
- be able to draw up plans and to make decisions foreseeing future consequences from a scientific, ethical, and societal perspective;
- be able to turn innovations in the area into feasible and successful business solutions;
- be able to profitably work in small size teams and contexts by considering all relevant elements and showing effective decision-making and leadership abilities.

Admission process:

- First application window deadline is 8th December!

Please note we recommend this deadline to NON EU/EFTA students requiring to apply for a VISA to study in Europe.

If you apply BY 8th December:

- you will be evaluated along December 2024.
- you will receive the offer from the EIT Manufacturing in January 2024.
- local enrolment will start in February*
- 9th December your application will be frozen and we don't consider any further modification and resubmission

*as a preliminary date, depending on the individual conditions of the university

➢ Second application window deadline is 15th January!

Please note we recommend this deadline to NON EU/EFTA students requiring to apply for a VISA to study in Europe.

If you apply BY 15th January:

- you will be evaluated along January 2025.
- you will receive the offer in February 2025.
- local enrolment will start in February*
- 16th January your application will be frozen and we don't consider any further modification and resubmission.

*as a preliminary date, depending on the individual conditions of the university

➢ Third application window deadline is 31st March 2025!

If you apply BY 31st March:

- you will be evaluated along April 2025.
- you will receive the offer in April 2025.
- local enrolment will start in April*
- 1st April March your application will be frozen and we don't consider any further modification and resubmission.

*as a preliminary date, depending on the individual conditions of the university

other IMPORTANT information:

- Please check special university requirements, before applying!
- Applicants must have completed a bachelor's degree encompassing a minimum of 180 ECTS credits.
- Students should have basic competence in engineering analysis, production operations, and mathematics including calculus, algebra, and mathematical statistics.
- Conditional acceptance:
    - Students in their final year of undergraduate education may also apply and if qualified, receive a conditional acceptance. If you have not completed your studies, please include a written statement from the degree administration office (or equivalent department), confirming that you are enrolled in the final year of your education and giving your expected completion date – which should be before the start of the master's programme.
    - If you receive a conditional offer, you should present your degree certificate to your entry university before enrolment at the latest.
- The specific required admission diplomas are:

B.Sc. degree in Mechanical Engineering, Electrical Engineering, Computer Engineering, Business Engineering, Management Engineering, Computer Science, Information Technology, Industrial Engineering or equivalent degrees.

B.Sc. degree in	Aalto University	TU Wien	SUPSI	UCD
Mechanical Engineering	Yes	Yes (case by case)	Yes	Yes
Electrical Engineering	Yes (case by case)	Yes (case by case)	Yes	Yes (case by case)
Computer Engineering	Yes (case by case)	No	No	No
Business Engineering	Yes (case by case)	No	No	No
Management Engineering	Yes (case by case)	No	No	No
Computer Science	Yes (case by case)	No	No	No
Information Technology	Yes (case by case)	No	No	No
Industrial Engineering	Yes (case by case)	Yes (case by case)	Yes (case by case)	Yes (case by case)
Other equivalent degrees	Yes (case by case)	Yes (case by case)	Yes (case by case)	Yes (case by case)

Documentation languages:

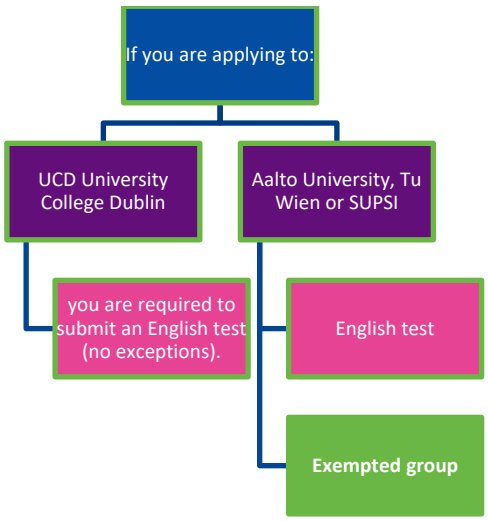
The entry qualification documents are accepted in the following languages: English (issued in or officially translated along with verified copies))

You must provide a duly certified copy of transcript of records in original language and translated into English. All courses must be included. Please scan the front and back of every document- all stamps and signatures must be fully visible.

Language requirements:

- Language proficiency requirements for EIT Manufacturing Master School

The language of instruction in all EIT Manufacturing Master School programmes is English. All applicants must provide proof of sufficient proficiency in English. Generally, the proficiency must be proved with sufficient results in a language test. Certain groups of applicants may be exempted from the language test but required to provide other documentation on their language proficiency. Only the tests and exemptions listed below will be accepted. Applications without acceptable proof of English proficiency will be discarded and not evaluated further. All language test results must be electronically verifiable.



Accepted English language tests and minimum scores

Please note that the English test must be taken on or after 30 September 2023. Older results will not be accepted.

- IELTS >= 6.5, with no section lower than 6 A photocopy of your test IELTS test result together with your application documents is sufficient.
- TOEFL IBT>= 93 (minimum 21 for writing, 19 in the other sections) English test results from TOEFL should be uploaded to your application form and **sent directly** from the ETS test centre to the EIT Manufacturing Master School Office. (EIT Manufacturing Master School code number: C898 , you can choose industrial engineering if you apply to "Platform for Digitalized Value Networks" and "Data Science and AI for Competitive Manufacturing", otherwise choose mechanical engineering for the other programmes))
- CAE: grades A – C are accepted. Attach the document to your application on the DreamApply portal.
- CPE: grades A – C are accepted. Attach the document to your application on the DreamApply portal.

Exempted group

Aalto University, Tu Wien or SUPSI you may be exempted from the English test if you meet one of the conditions presented below in the table:

Exempted group	Required proof
Applicants who have completed a bachelor's degree (180 ECTS or equivalent) instructed in English at a university in an EU/EFTA country.	Degree certificate, diploma supplement, transcript of records or other official document issued by the institution clearly stating the language of instruction.

Applicants who have completed a bachelor's degree instructed in English at a university that is physically located in one of the following countries: Antigua and Barbuda, the Bahamas, Barbados, Belize, Botswana, Cameroon, Canada, Dominica, Eritrea, Eswatini, Ethiopia, Gambia, Ghana, Grenada, Guyana, Hong Kong, India, Jamaica, Kenya, Lesotho, Liberia, Malawi, Namibia, Nigeria, the Philippines, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sierra Leone, Singapore, South Africa, Switzerland, Tanzania, Trinidad and Tobago, Uganda, Zambia, or Zimbabwe.	Degree certificate or proof of estimated graduation granted by a university in this country.
Applicants who have completed a bachelor's degree instructed in English at a university that is physically located in one of the following countries: Australia, Canada, New Zealand, the United Kingdom, or the United States.	Degree certificate or proof of estimated graduation granted by a university in this country.
Applicants who have completed **secondary education** degree instructed in English in: an EU/EEA country, Australia, Canada, New Zealand, South Africa, Switzerland, the United Kingdom or the United States while residing in that country.	Secondary-school final certificate in PDF format. If the degree is completed in an EU/EEA country, Switzerland or South Africa, English as the language of instruction must be stated unambiguously on the certificate. For those countries, if the language of instruction is not indicated on the certificate, upload an official document issued by the institution clearly stating the language of instruction.

Documents to submit:

To apply to the Master School, you are required to upload the following documents/elements.

IMPORTANT: you need to **submit a complete application package** consisting of the following documents, in pdf and portrait format, **before the application deadline.**

It is every prospective student´s responsibility to make sure their application is correct and complete.

- **Degree Certificate/Diploma in its original language AND translated into English** (If your university does not provide this service, the translation has to be done by an authorized translator and his/her credentials, signature and stamps must be visible in the translated document). In case of on-going studies, a statement certifying that you are in the final year of your studies. The statement must be written by the degree administration office (or equivalent department), confirming that you are enrolled on the final year of your education and giving your expected completion date.

- **Official and stamped transcript of records in original language and translated into English.** All courses taken must be included. Please scan the front and back of every document- all stamps and signatures must be fully visible.

- **Proof of English proficiency.** Please refer to the 'Language requirements' section for more information.

- **Curriculum Vitae** including details on your academic and professional career, based on EuroPass template CV. Please note that no other CV formats than EuroPass will be accepted and your application will be automatically rejected if you do not meet this condition.

EuroPass CV editor you can find here: europa.eu/europass/eportfolio/screen/cv-editor?lang=en

- **Records of evidence** Please attach an additional, single PDF file, which will be a record and supporting document of your CV. This means that if you have

references, letters of recommendation, employment certificates, volunteer work certificates, contacts to people etc. who can attest to your educational and professional activity. All these evidence files must be one PDF, which you can create using a simple online creator.

- **Motivation short movie** A short motivational movie (max 2 minutes). In the movie, please answer two questions:

    1) Why are you fit for this program?

    2) where do you see yourself five years after graduation?

- **A coloured copy of your either National ID (only for EU/EFTA students) or passport**

Please notice that, from the moment you are admitted, your university will contact you to complete the formalities for enrolment and might request additional documents from you.

IMPORTANT:

- Please upload the **original version of your degree certificate and transcript of records.** If this is not possible, photocopies of your degree certificate, transcript of records and statements should be **stamped and signed by the degree administrations office (or equivalent department) of the issuing institution, or by a Notary Public.** Please note that we do not accept documents after the deadline. All documents must be uploaded/come in before the deadline in order for us to process your application.

- **Applications that are not supported by official documents will not be processed.**

- **Applications with fraudulent documents will invariably be rejected.**

- **All admitted students must present the original Transcript of records and Degree Certificate/Diploma before enrolment.**

VISA:

Applicants are responsible for their own VISA.

SPECIAL UNIVERSITIES REQUIREMENTS

This applies only if the below universities are a possible choice for the programme you want to apply

- For NON EU/EFTA students choosing SUPSI (University of Applied Sciences and Arts of Southern Switzerland – Switzerland) as entry/exit university, before applying, please note you need to: submit 2 applications:

1. one application into DreamApply portal
2. second application into SUPSI local portal by 30th April, to be eligible to enrol locally: www.supsi.ch/home_en/bachelor-diploma-master/informazioni-generali/iscrizioni.html .

Please keep in mind this in case you request a VISA to study in EU.

- check the Switzerland entry requirements at: www.sem.admin.ch/sem/it/home/publiservice/weisungen-kreisschreiben/auslaenderbereich/verfahren_und_zustaendigkeiten.html
- check NOT ELIGIBLE Countries for VISA in Switzerland at: www.sem.admin.ch/dam/sem/it/data/rechtsgrundlagen/weisungen/auslaender/verfahren/zustimmungspfl-studierende-i.pdf.download.pdf/zustimmungspfl-studierende-i.pdf.

SYLLABI:

Study plan
Aalto - TUWien collaboration

General structure of the EIT-M 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

Entry university Aalto – exit university TUWien

Entry year Aalto 2025-2026

Type of modules	Course code and name at Aalto	ECTS	Semes-ter	Total credits
	Compulsory courses			
SC	MEC-E1003 Machine Design Project	5	1	10 ECTS

	MEC-E1075 Selection of Materials and Manufacturing Processes	5	1	
TC	MEC-E7006 Advanced Manufacturing	5	2	
	MEC-E7009 Design for Additive Manufacturing	5	2	
	Optional courses (select 25 ECTS)			
	MEC-E1090 Quality Management and Metrology	5	1	
	ELEC-E8113 Information Systems in Industry	5	1	35 ECTS
	MEC-E1061 Computer-Aided Engineering	5	1	
	MEC-E6002 Welding Technology and Design	5	2	
	MEC-E7012 Manufacturing Operations	5	2	
	MEC-E7013 Casting and Forming Technologies	5	2	
	MEC-E7011 Machining Processes	5	2	
I&E	TU-E4101 Entrepreneurship Lab	10	2	
	LC-1317 Integrated Project Communication for MSc Students (o,w) **	3	2	
	Optional courses (choose 3 ECTS)			15 ECTS
	TU-C2080 Entrepreneurship Essentials *	1	1	
	TU-C2090 Starting Up *	1	1	
	MEC-E3900 Prototyping Tools at the Design Factory *	1	1	
	JOIN-E3910 Design Thinking for Innovation *	1	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 Entrepreneurship Lab in the spring.

**) Integrated with Entrepreneurship Lab; 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 Entrepreneurship Lab and Integrated Project Communication course.

Exit year at TUWien 2025-2026

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	10	10	Min. 12		**45**
SC	15	10	Min. 5		**15**
I&E	3	12	13	0	**30**
MT				30	**30**
Tot	28	32	23	37	**120**

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

- Study plan –
UCD - Aalto collaboration

General structure of the EIT-M 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

Entry university UCD– exit university Aalto

1st year UCD

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.

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**

Short description:

This study plan focuses on the fundamentals of manufacturing engineering and computational mechanics while levering the materials science discipline knowledge to inform full flexibility in producing additively manufactured products.

Study plan
- SUPSI TUWien collaboration–

General structure of the EIT-M 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

Entry university SUPSI – exit university TUWien

1st year SUPSI

Draft plan:

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_FatigueDesign	3	2	
	TSM_PlaFaAna Plastic failure analysis and prevention	3	2	

	FTP_AppStat: Applied Statistics and Data Analysis	3	2	
	FTP_MultiASys: Multi-agent systems	3	2	
	CM_AdvProjMgmt Advanced Project Management	3	1	
	MP_CAE: Computer Aided engineering**	9	2	
SC	MS_TPEMAM: Seminar – Technologies, Processes and Equipment for Metal based Additive Manufacturing**	6 (4+2)	1,2	9 (7 sem1, 2 sem2)
	TSM_Structural and Vibration	3	1	
I&E	Computational Design for Advanced Topology Optimization**	3	2	13 (10 sem1; 3 sem2)
	CM_InnoLEAN: Innovation and Lean	3	1	
	PSM Project on Additive Manufacturing*	7	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

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	*Elective courses I&E (minimum 8 ECTS)*			min. 13 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)	

MT	Master thesis: Focus on Additive Manufacturing for full flexibility	30	2 (SS)	30

Recap

SUPSI – TUWien

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	2	3	2	**14**
I&E	10	8	13	0	**31**
MT				30	**30**
Tot	26	34	23	37	**120**

- Study plan –
UCD - SUPSI collaboration

General structure of the EIT-M 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

Entry university UCD – exit university SUPSI

1st year UCD

Draft plan:

Type of modules	UCD courses	ECTS	Semes-ter	Total credits
TC	Computational Continuum Mechanics II	5	1	30 (15 sem 1 15 sem 2)
	Manufacturing Engineering II	5	1	
	Advanced Metals & Materials Processing	5	1	
	Advanced Polymer Engineering (core)	5	2	
	Materials Science and Engineering III (core)	5	2	

	Operations Management (core)	5	2	
SC	Medical Device Design	5	1	10 (5 sem 1 5 sem 2)
	Mechanical Engineering Design I	5	2	
I&E	Design & Innovation	5	1	15 (10 sem 1 5 sem 2)
	Technical Communication	5	1	
	Professional Eng. (Finance) (option)	5	2	
	Professional Engineering (Management) (option)	5	2	

*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 SUPSI

Type of modules	SUPSI courses	ECTS	Semes-ter	Total credits
TC	TSM_ManTech (ZH, Tue morning)	3	1	15 (15 sem 1)
	FTP_OrdDiff: Ordinary Differential Equations and Dynamical Systems	3	1	
	TSM_Structural and Vibration	3	1	

	CM_IntSust: Integrated Sustainable Management of Production Systems	3	1	
	TSM_Materials Selection and Design	3	1	
SC	MS_TPEMAM: Seminar – Technologies, Processes and Equipment for Metal based Additive Manufacturing**	6 (4+2)	1,2	6 (4 sem1, 2 sem2)
I&E	CM_InnoLEAN: Innovation and Lean	3	1	10 (7 sem1, 3 sem2)
	PSM Project on Additive Manufacturing*	4	1	
	CM_QRM: Quality and Risks management	3	2	
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	15	15	15	0	**45**
SC	5	5	4	2	**16**
I&E	10	5+5	7	3	**30**
MT				30	**30**
Tot	30	30	26	35	**121**

Study plan
UCD - TUW collaboration

General structure of the EIT-M 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

Entry university UCD – exit university TUW

1st year UCD

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

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**