Human-Robot Interaction for Sustainable Manufacturing

Master Science programme

General. Basic information

Name & type	MSc Human-Robot Interaction for Sustainable Manufacturing
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 **Human-Robot Interaction for Sustainable Manufacturing previous "People and Robots for Sustainable Work"** is a **Master of Science** level programme within the EIT Manufacturing (EITM) Master School. The EITM Master School is a highly prestigious Manufacturing Engineering and Science education provider on advanced level with a focus on Innovation and Entrepreneurship (I&E). The education at EIT Manufacturing Master School combines technical competence 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.

The EIT Manufacturing 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.

Human-Robot Interaction for Sustainable Manufacturing previous "People and Robots for Sustainable Work" is a combination of studying manufacturing science including physics of robotic systems, control system automation including exploiting the design freedoms enabled for more customized manufacturing processes, and production management. During the programme students will gain new skills in these areas.

In manufacturing science, relevant fields include robot and manufacturing process modelling, control and automation.
In design engineering, relevant fields are robot kinematics and dynamics, trajectory optimization, process physics simulation, people interaction in manufacturing and sustainable design engineering.
In production management, relevant fields include 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 PRSW include heavy duty manufacturing, rapid prototyping, digital twins and autonomous 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)**:

- University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland
- University of Tartu (TARTU) Estonia

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

- University of Tartu (TARTU), Estonia
- Technische Universität Wien – (TU WIEN), Austria
- University of Trento (UNITN), Italy

Possible combinations:

Combination	ENTRY University (YEAR 1)	EXIT University (YEAR 2)
Combination 1	SUPSI (Switzerland)	TU Wien (Austria)
Combination 2	SUPSI (Switzerland)	UniTrento (Italy)
Combination 3	SUPSI (Switzerland)	UniTartu (Estonia)
Combination 4	UniTartu (Estonia)	UniTrento (Italy)

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 us mandatory local language courses. You you will be informed by your university about this.

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 Human-Robot Interaction for Sustainable Manufacturing programme of 120 ECTS, students will get two degrees from each entry and exit university, according to the following list:

- TARTU: Master of Science in Engineering (Robotics and Computer Engineering) => 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: Diplomingenieur/Master of Science (presently the involvement on TU Wien is based on the existing program in Manufacturing and Robotics – Master programme UE 066517 – 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. 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.

A student who graduates from the Human-Robot Interaction for Sustainable Manufacturing shall:

- have broad knowledge of theories and concepts in urban planning, transport and sustainability, and its disciplinary foundations, proven experience in working with methodological knowledge in the area of manufacturing challenges, and a considerable degree of specialised 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 PR 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 taking into account 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 MUST have basic competence in engineering analysis, programming, 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 enrollment at the latest.
- The specific required admission diplomas are:

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

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

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

This document presents the general syllabi of all the MSc double degrees available within the EIT Manufacturing "Human-Robot Interaction for Sustainable Manufacturing" programme. Please note these are the basic versions of the study plans, 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 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. You can also find local websites with the up-to-date information about the courses.

General structure of the EIT-M Master Programmes

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

SUPSI - TUWien collaboration–

Entry university SUPSI – exit university TUWien

1st year SUPSI

Type of modules	SUPSI courses	ECTS	Semes-ter	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_IndRobot Engineering of industrial robot	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 (3 sem.1, 6 sem.2)
	TSM_AdvRobot: Advanced Robotics (ZH, Tue morning)	3	1	
I&E	CM_InnoLEAN: Innovation and Lean	3	1	13 (8 sem.1 5 sem.2)
	PSM_ Project on Robotics and Automation*	10 (5+5)	1, 2	

*PSM modules: they are examples 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 ECTS

*** The Summer School takes place in the summer period in July and/or August.

2nd year TUWien

Type of modules	TUWien courses	ECTS	Semes-ter	Total credits
TC	*Elective courses TC (min. 12 ECTS)*			min. 12 ECTS
	330.265 Assistance Systems in Manufacturing 1	3	1 (WS)	
	330.273 Assistance Systems in Manufacturing 2	3	2 (SS)	
	330.296 Cobot Studio @Pilot Factory for Industry 4.0	3	1 (WS)	
	330.291 Digital Simulation of Ergonomics and Robotics (DSER)	3	1 (WS)	
	VU Programming and Simulation of Machining Systems (CAD/CAM)	3	1 (WS)	
	307.440 Ecodesign, Sustainable Product Development	3	1 (WS)	
SC	*Compulsory courses SC*			min. 6 ECTS
	376.081 Machine Vision	4,5	1 (WS)	
	Elective courses SC (min. 1,5 ECTS):			
	307.490 Product Lifecycle Management (VO)	2	2 (SS)	
	193.085 Human Robot Interaction	3	1 (WS)	
	VU Programming and Simulation of Machining Systems (CAD/CAM)	3	1 (WS)	
	307.520 Mobile Robotics	3	2 (SS)	
	311.745 Intelligent Manufacturing Systems	3	2 (SS)	

	325.112 Robot Control	3	2 (SS)	
	328.011 Digital Control	3	2 (SS)	
	193.106 Intelligent User Interfaces	3	1 (WS)	
	188.501 Similarity Modeling 1 - Computational Seeing and Hearing	3	1(WS)	
	188.460 Multimedia Interfaces	3	1(WS)	
	188.413 Self-Organizing Systems	4,5	1 (WS)	
I&E	*Compulsory courses I&E:*			min. 12 ECTS
	330.311 Robot Challenge	9	1 (WS)	
	Elective courses I&E (min. 3 ECTS)			
	330.258 Innovation Theory	3	1 (WS)	
	330.287 Technology, Work and Organization	3	1 (WS)	
	164.287 European Union - Institutions, Policies and Future Challenges	2	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 People and Robots for Sustainable Work	30	2	30

Local up-to-date webpages for entry/exit university courses

The following two webpages contain the up-to-date description of both masters:

- https://www.supsi.ch/en/mse-mechatronics-automation
- https://tiss.tuwien.ac.at/curriculum/public/curriculum.xhtml?key=70848

ECTS Summary by modules and semesters

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	18	15	12		45
SC	3	6	6		15
I&E	8	10	12		30
MT				30	30
Tot	29	31	24	35	120

SUPSI – UNITN collaboration–

Entry university SUPSI – exit university UNITN

1st year SUPSI

Type of modules	SUPSI courses	ECTS	Semes-ter	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_IndRobot Engineering of industrial robot	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 (3 sem.1, 6 sem.2)
	TSM_AdvRobot: Advanced Robotics (ZH, Tue morning)	3	1	
I&E	CM_InnoLEAN: Innovation and Lean	3	1	13 (8 sem.1 5 sem.2)
	PSM_ Project on Robotics and Automation*	10 (5+5)	1, 2	

*PSM modules: they are examples 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 ECTS

*** The Summer School takes place in the summer period in July and/or August.

2nd year UNITN

Type of modules	UNITN courses	ECTS	Semes-ter	Total credits
TC	*Mandatory course*			12 ECTS
	146217 Software development for collaborative robotics	6	1	
	Elective Courses			
	145872 Distributed Robot Perception	6	1	
	146216 Optimisation and Learning for Robot Control	6	1	
	Additional elective courses from this list: *https://offertaformativa.unitn.it/en/lm/artificial-intelligence-systems/curricula#free-choice*	6	1	
SC	145874 Robot Planning and its Applications	6	1	6 ECTS
I&E	145881 AI and innovation	6	1	12 ECTS
	145936 Innovation and Entrepreneurship Basic	6	1	
MT	Master thesis: focus on human-robot interaction	30	2	30 ECTS

Local up-to-date webpages for entry/exit university courses

The following two webpages contain the up-to-date description of both masters:

- https://www.supsi.ch/en/mse-mechatronics-automation
- https://ois2.ut.ee/#/curricula/136637/version/2024/details

ECTS Summary by modules and semesters

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	18	15	12		42
SC	3	6	6		15
I&E	8	5 + 5 Summer school	12		30
MT				30	30
Language					
Total	29	31	30	30	120

SUPSI – UTARTU collaboration–

Entry university SUPSI – exit university UTARTU

1st year SUPSI

Type of modules	SUPSI courses	ECTS	Semes-ter	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_IndRobot Engineering of industrial robot	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 (3 sem.1, 6 sem.2)
	TSM_AdvRobot: Advanced Robotics (ZH, Tue morning)	3	1	
I&E	CM_InnoLEAN: Innovation and Lean	3	1	13 (8 sem.1 5 sem.2)
	PSM_ Project on Robotics and Automation*	10 (5+5)	1, 2	

*PSM modules: they are examples 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 ECTS

*** The Summer School takes place in the summer period in July and/or August.

2nd year UTARTU

Type of modules	UTARTU courses	ECTS	Semes-ter	Total credits
TC	Data Acquisition and Signal Processing LOTI.05.052	6	1	min. 12 ECTS
	Introduction to Data Science LTAT.02.002	6	1	
	Machine Learning MTAT.03.227	6	1	
	Algorithmics MTAT.03.238	6	1	
SC	Technical Graphics II LOTI.05.092	3	1	min. 6 ECTS
	Soft Robotics LOTI.05.082	3	1	
	Autonomous Vehicles Project LTAT.06.012	3	1	
I&E	Marketing MJJV.02.092	5	1	Min. 12 ECTS
	Innovative Organization and Intrapreneurship SVMJ.03.005	6	1	
	Innovation Policy SVMJ.08.001	6	1	
	Principles of Management MJJV.03.146	6	1	
MT	Master thesis: focus on human-robot interaction	30	2	30
	Estonian for beginners I*	6	1	6

* The language course is counted outside the 120 ECTS because it cannot be recognized by the entry university.

Local up-to-date webpages for entry/exit university courses

The following two webpages contain the up-to-date description of both masters:

- https://www.supsi.ch/en/mse-mechatronics-automation
- https://ois2.ut.ee/#/curricula/136637/version/2024/details

ECTS Summary by modules and semesters

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	18	15	12		45
SC	3	6	6		15
I&E	8	5 + 5 Summer school	12		30
MT				30	30
Language			6		6
Tot	29	31	36	30	126

UTARTU - UNITN collaboration–

Entry university UTARTU – exit university Trento

1st year UTARTU

Type of modules	UTARTU courses	ECTS	Semes-ter	Total credits
TC	Data Acquisition and Signal Processing LOTI.05.052	6	1	30 ECTS
	Robotics I LOTI.05.010	6	1	
	Machine Learning MTAT.03.227	6	1	
	Technical Graphics II LOTI.05.092	3	1	
	Introduction to Data Science LTAT.02.002	6	1	
	Artificial and Natural Intelligence LTAT.02.024	6	1	
	Robotics Technology LOTI.05.057	6	2	
	Deep Learning for Computer Vision LTAT.02.028	6	2	
	Neural Networks LTAT.02.001	6	2	
SC	Robotics II LOTI.05.088	6	2	12 ECTS
	Human-Robot interaction (NEW)	6	2	
I&E	Marketing MJJV.02.092	5	1	min. 13 ECTS
	Innovative Organization and Intrapreneurship SVMJ.03.005	6	1	
	Innovation Policy SVMJ.08.001	6	1	
	Principles of Management MJJV.03.146	6	1	
	Applied Creative Destruction Lab with Startups SVMJ.00.032	6	1+2	
	Management of project teams SVMJ.03.013	6	2	

	The Basics of Innovation MJJV.07.102	3	2	
	Strategic Management MJJV.08.048	3	2	
-	Estonian for beginners I*	6	1	6 ECTS

* The language course is counted outside the 120 ECTS because it cannot be recognized by the exit university.

I&E	Centrally organized summer school	5	2**	5 ECTS

** The Summer School takes place in the summer period in July and/or August.

2nd year UNITN

Type of modules	UNITN courses	ECTS	Semes-ter	Total credits
TC	*Mandatory course*			12 ECTS
	146217 Software development for collaborative robotics	6	1	
	Elective Courses			
	145872 Distributed Robot Perception	6	1	
	146216 Optimisation and Learning for Robot Control	6	1	
	Additional elective courses from this list: *https://offertaformativa.unitn.it/en/lm/artificial-intelligence-systems/curricula#free-choice*	6	1	
SC	145874 Robot Planning and its Applications	6	1	6 ECTS
I&E	145881 AI and innovation	6	1	12 ECTS
	145936 Innovation and Entrepreneurship Basic	6	1	
MT	Master thesis: focus on human-robot interaction	30	2	30 ECTS

Local up-to-date webpages for entry/exit university courses

The following two webpages contain the up-to-date description of both masters:

- https://ois2.ut.ee/#/curricula/136637/version/2024/details
- https://offertaformativa.unitn.it/en/lm/artificial-intelligence-systems/curricula

ECTS Summary by modules and semesters

Type of modules	ECTS in S1	ECTS in S2	ECTS in S3	ECTS in S4	Total credits
TC	24	6	12		**42**
SC		12	6		**18**
I&E	6	9 + 5 Summer school	12		**32**
MT				30	**30**
Language	6				**6**
Total	36	32	30	30	**128**