



SCIENCE, TECHNOLOGY, HEALTH

M2 Industry 4.0

Master Computer science

ECTS 60 credits Duration 1 year

Component Collège Sciences et Technologies pour l'Energie et l'Environnement (STEE)



Presentation

Apply here from October to March

The aim of this master's is to train Computer Sciences and Information Technologies experts in order to be able to address the new challenges of the current and future generations of digital societies. Current trends in digital technologies represented by the Internet of things, cyberphysical systems, social networks, cloud computing, big data, business intelligence, machine-learning, artificial intelligence, mobile robotics, digital twin, and additive manufacturing have provided the basis for a new industrial revolution named Industry 4.0.

Our **Industry 4.0 Computer Sciences Master's** degree offers a 1 year, full-time postgraduate program, aimed at providing solid scientific and technological foundations in order to innovate, design, and develop future digital organizations based on the new Smart Anything Everywhere (SAE) paradigm. It is suited for students planning both an academic or an industrial career and provides the theoretical basis and the practical expertise required to pursue research or R&D organizations. The master's is fully taught in English providing a main core curriculum and two options named IT Digital Transformation and Digital Manufacturing.

This master's is hosted by the College of Sciences and Technologies for Energy and Environment (STEE) of the Université de Pau et des Pays de l'Adour (UPPA) in Anglet (France) as well as by The National Engineering School of Tarbes (ENIT) of the National Polytechnic Institute of Toulouse, in Tarbes (France).

This master is supported by the prestigious French Initiative of Excellence label I-SITE (Initiatives Sciences, Innovation, Territories, and Economy) obtained by the E2S-UPPA project and profits from the territorial synergy of the Aerospace industry located in the southwest valley of France.

The program is carried out in close collaboration with the Computer Sciences Laboratory of the UPPA (LIUPPA research laboratory) and with the Production Engineering Laboratory of the ENIT (LGP research laboratory) as well as several R&D organizations, where scientific and experimental practicals will be performed.

Students will also benefit from the global research environment and administrative support of the University Pau & Pays Adour, the ENIT, and the E2S I-site program.





Objectives

* Prepare students at an advanced specialized level to meet present and future scientific and technological challenges in digital industries and enterprises.

* Develop research skills to engage in quality and successful research,

* Prepare students for leading positions in private and public organizations in research and development departments.

Your university

Pau

Tarbes

Skills

At the end of this program, the students in the « **Industry 4.0 Computer Science Master**" will be able to:

* Identify and analyze the functional and nonfunctional requirements of digital organizations (industries and enterprises).

* Design and model multi-dimensional architectures resulting from the integration and coordination of Internet of Everything entities (IoT, Data, People, Services, Cloud Computing infrastructures, robots, 3D printers, etc.) aimed at satisfying the requirements of digital organizations.

* Develop and implement a proof of concept system integrating the various Internet of Everything dimensions.

* Design and conduct experiments in order to test and evaluate Industry 4.0 systems.

* Review, analyze, and interpret the body of scientific literature, contemporary issues, and innovations in computer sciences and information technologies disciplines.

* Carry out a research project aimed at developing a state-of-the-art as well as identifying and solving scientific and technological challenges within the context of Industry 4.0.

Additional information

Program intensity: Full-time

Duration: 1 year

Languages: Fully taught in English

Delivery mode:

- * On Campus at STEE College and LIUPPA Laboratory (Anglet) for the IT Digital Transformation option.
- * On Campus at ENIT and LGP Laboratory (**Tarbes**) for the Digital Manufacturing

This program is open to work-study and lifelong learners and can be followed under a dual-training scheme.

Scholarships

- * EIFFEL Scholarship of Excellence
- * Talents' Academy Grants
- Catalogue des Bourses Campus France | ____
- * Other funding possibilities with dual training (alternance)

The International Master Programs Admission Office

master.programs@univ-pau.fr

Organisation





Organization

Master 2 C	Business Intelligence			
	and Business			
	Analytics			
Course Title	Course Description	ECTS*		
Industry 4.0 cyber- physical Systems Engineering & Innovation	This course is designed to allow learners to acquire theoretical and practical competencies to understand and to carry on requirements analysis and design of systems, integrating referential models of system engineering and methodologies well adapted	4		
	for Cyber- Physical Systems of Industry 4.0. The course will follow a project- based		Research Initiation	

	teaching methodology.	
Business Intelligence and Business Analytics	This course aims at providing students with the foundations and developing competencies in designing data flow paths allowing the construction of multi- dimensional data warehouses as well as the implementation of machine learning techniques in order to implement diagnosis, prediction, and prescription models for smart systems.	4
Research Initiation	This course is designed to provide students with theoretical and practical skills to carry out a	3





	research project and in particular to			in French or English.		
	understand and be able		IT Digital Transformation option (UPPA ANGLET Campus)			
	* Analysis		Service and Micro- Service Oriented Architectures	This course aims at providing students with the	4	
	or a context and formulation of a problem			concepts and approaches for understanding and		
	* Study and analysis of the state-of- the-art			designing distributed systems allowing them in particular		
	and existing solutions * Propose solutions			understand and to apply service- oriented and micro-		
	and/or recommendat * Research articles production and evaluation			services- oriented methods for designing and developing		
French as a Foreign Language, English	This course aims at acquiring competencies in both written and oral communication	3		systems and systems of systems. Integration and interoperability solutions will be studied and applied.		





Cloud Computing Services and Technologies I	The aim of this course is to provide students with the knowledge and competences in order to	2		organizations. This course is about designing at the infrastructure, middleware, and software levels.	
	design and develop scalable, secure, and cost-efficient infrastructures, platforms, and software as a service for digital organisations. This course is about virtualization and Dock containers.		Internet of Things	 The aim of this course is to provide students with the knowledge and competencies in order to design and develop Smart IoT systems 	4
Cloud Computing Services and Technologies II	The aim of this course is to provide students with the knowledge and competencies in order to design and develop scalable, secure, and cost-efficient infrastructures, platforms, and software as a service for digital	2		based on the integration and orchestration of sensors and effectors objects of cyber- physical systems such as : * Explain how businesses can extract	





	information and insights from IoT Data. * Understar		Digital Manufa	generations of information systems.	Tarbes Campus)
	 * Onderstand the steps of the Data Data Analysis Lifecycle and perform these tasks. * Explain the different types of data analytics: 		Advanced Robotics	At the end of this course, the student should be able to analyze a given application in order to establish a robotic/ cobotic solution to automatize	4
	descriptive, predictive, and prescriptive.			it by considering different aspects and constraints.	
Semantic Web, Advanced Databases, and Open Linked Data	This course aims to provide students with basic skills for designing and developing structured and unstructured advanced databases to cope with the heterogeneous data plane dimensions required by the	4		From this training, the student will be also able to explain robotics tools (models, trajectory generator, and control law), use them, and justify their choices in a specific context.	





	Some specific aspects related to robotics in interaction and collaboration with humans will be addressed as well.			and futures technologies, to analyze in-depth 3D metal printing (technical limitations, detailed costs, defects causes/ solutions) to	
Advanced virtual environments	The aim of this course is to present the basic concepts of Virtual Reality (such as hardware interfaces, software functionalities, or development environments), as well as some recent scientific and applicative advances of	4		solutions), to explore the topological design methods and the process simulation/ monitoring, with professors and 3 industrial partners, and ending with an application project.	
	Virtual Reality in the framework of industry 4.0, and digital twins.		Advanced Distributed and Embedded Systems	The aim of this course is to present and manipulate processors (e.g. FPGA.	4
Advanced Additive Manufacturing	The aim is to provide technical bases on 3D printing, current	4		micro- controller, Arduino, ESP) in charge of treating information	





	coming from sensors (including lighting systems, signals, and images) using a wireless interface (e.g. BLE, WIFI) as well as enabling the control of distributed intelligent systems through		Industry 4.0, Smart Manufacturing, Autonomous Vehicles, Smart Building, Smart Enterprises including Business Intelligence and Business Analytics		
	actuatora or		(Machine		
	actuators of				
	enectors.				
ACADEN	IC SEMESTER 2 INT	ERNSHIP	* ECTS: European Credit Transfer and Accumulation		
Research Internship	This internship is intended to allow students to	30	Open to apprenticeship		
	apply a scientific approach		Trainings		
	and project management		Intership : Mandatory		
	for an		Intership duration : 5-6 months		
	industrial research project.		Abroad intership : Optional		
			Admission		





Academic requirements

This second year of the Master's degree is open to students after completion of the first year of a Master's degree or Diploma equal to bac+4 from a European university (minimum of 240 ECTS credits) in Engineering, Science, or Equivalent (Bachelor of Engineering, Bachelor of Science or Equivalent).

Admission requirements

Applicants must be fluent in English, both in writing and speaking. An applicant whose native language is not English has to take a recognized international English test.

This program is open to work-study and lifelong learners.and can be followed under a dual train-scheme.

English Language Requirements

Minimum required score: CECRL B2

Tuition Fees and partial exemptions

Go to the Tuition fee page

The school partially exempts non-EU students from the differentiated fees for initial training enrolling in the Master's program.

Student capacity

20

And after

Further studies

Sectors

* Computer Science, Information Technologies, Systems Engineering, Digital Mentor, Collaborative Robots Expert, IT/OT Integration Manager, Industrial Big Data Scientist, Lean 4.0 Engineer

Fields

* Industry, Research, and R&D structures

Positions

* Ph.D. student and R&D Engineer

Useful info

Contacts

Administration contact

M2 Industry 4.0 masteri40@univ-pau.fr

Head of Teaching

Ernesto Exposito Garcia ernesto.exposito-garcia@univ-pau.fr

Partner schools

ENIT

https://www.enit.fr/fr/formations/masters/masterindustry-4-0-1.html

LIUPPA

L http://liuppa.univ-pau.fr/fr/index.html





Place

Anglet

Q Tarbes

Campus

Anglet

A Tarbes





Program

Industry 4.0 Semester 9