Competencies Families	Specific Learning Outcomes (Industrial Computing Engineering)	
Family 1 *Scientific and Technical Tools*	**SLO1**	Gaining advanced knowledge of computing theories, methods, practices and scientific tools for engineering.
	SLO2	Applying computing engineering to analyze, solve and optimize complex problems in practical engineering fields.
	SLO3	Demonstrating advanced knowledge of control systems, embedded systems design, software engineering methodologies, artificial intelligence, and data science techniques for designing and implementing innovative solutions in industrial computing engineering contexts.
Family 2 *Technological Skills*	**SLO4**	Acquiring practical skills in relevant sub-areas of the field of industrial computing engineering at Master level.
	SLO5	Designing a research or project plan on the basis of a realistic problem description in the field of computer science and can contribute to its progress with original solutions.
	SLO6	Applying industrial complex systems and software development and management principles, methodologies, techniques, and tools to innovatively and creatively analyze, design, implement and evaluate systems and applications at various complexity levels.
	SLO7	Selecting appropriate hardware, software, tools, and technologies to develop, integrate, test, configure and maintain secure industrial computing infrastructure, networks, systems, and applications that satisfy the users' needs while considering relevant risks and latest technological advances.
	SLO8	Designing, constructing, and refining intricate industrial control systems, ensuring optimal functionality, efficiency, and reliability to meet industry demands and enhance operational performance.

	SLO9	Developing and analyzing embedded systems, considering real-time constraints and hardware limitations, to design solutions that ensure robust performance and functionality across diverse real-world application domains.
	SLO10	Designing solutions for complex engineering problems that meet specified needs with consideration for public health, safety, welfare, and environmental, sustainability, and economic factors, as well as other realistic constraints related to the design solution, while complying with relevant standards and design codes.
Family 3 *Communication and Managerial Skills*	**SLO11**	Developing the required soft and foreign language communicative as well as managerial skills.
	SLO12	Communicating effectively to demonstrate the results, knowledge, skills, and advanced principles in a variety of professional contexts.
Family 4 *Self-development, Innovation and Projects*	**SLO13**	Collaborating effectively within teams to manage projects successfully, design, develop, and implement innovative solutions.
	SLO14	Working with autonomy as a responsible citizen, constructive decision-maker, and cooperative team member based on universal ethics and principles with the ability to develop entrepreneur and leadership skills and actively participating in serving the society.

Semester	Subject	Coefficient	ECTS	Total Workload	Lecture / Tutorials	Lab	Project / Self-directed Study	Private Study
1	**Methods / Skills Modules (8 ECTS)**							
	Engineering Mathematics	2	4	120	45	-	-	75
	Probability and Stochastic Processes	2	4	120	45	-	-	75
	Technical CORE Modules (16 ECTS)							
	Algorithms and Programming	2	4	120	30	30	-	60
	Computer Networks	2	4	120	40	20	-	60
	Operating Systems	2	4	120	30	15	-	75
	Electronic System Design	2	4	120	30	30	20	40
	Management, Leadership, and Academic Skills Modules (6 ECTS)							
	Engineering Professional Practice	1,5	3	90	30	-	-	60
	Advanced English for the University 1	1,5	3	90	30	-	-	60

Semester	Subject	Coefficient	ECTS	Total Workload	Lecture / Tutorials	Lab	Project / Self-directed Study	Private Study
2	**Methods / Skills Modules (8 ECTS)**							
	Advanced Mathematics for Engineers	2	4	120	25	20	15	60
	Students must complete 1 course by 3 of 4 ECTS from those listed below							
	Numerical Methods	2	4	120	40	20	-	60
	Optimization Techniques	2	4	120	25	20	-	75
	Discrete Mathematics	2	4	120	45	-	-	75
	Technical CORE Modules (16 ECTS)							
	Automata, Computability, and Complexity	2	4	120	45	-	-	75
	Databases and Web Services	1,5	3	90	20	25	20	25
	Students must complete 3 courses by 6 of 3 ECTS from those listed below							
	Secure and Dependable Systems	1,5	3	90	30	-	-	60
	Computer Systems Architecture	1,5	3	90	20	25	-	45

	Web Systems Engineering	1,5	3	90	15	30	-	45
	Object Oriented Design and Patterns	1,5	3	90	45	-	-	45
	Paradigms of Programming	1,5	3	90	25	20	-	45
	Linear Systems, Signals & Control	1,5	3	90	30	15	-	45
	Management, Leadership, and Academic Skills Modules (6 ECTS)							
	Entrepreneurship and Intrapreneurship	1,5	3	90	30	-	20	40
	Advanced English for the University 2	1,5	3	90	30	-	-	60

Semester	Subject	Coefficient	ECTS	Total Workload	Lecture / Tutorials	Lab	Project / Self-directed Study	Private Study
3	**Technical CORE Modules (20 ECTS)**							
	Mandatory Modules (16 ECTS)							
	Real Time Systems	2,25	4	120	40	20	20	40
	Embedded System Design	2,25	4	120	15	30	35	40
	Control Engineering	2,25	4	120	40	20	-	60
	Advanced Automation System	2,25	4	120	30	30	-	60
	Elective Modules (4 ECTS) *Students must complete 1 course by 5 of 4 ECTS from those listed below*							
	Advanced Computing Systems	2	4	120	30	30	-	60
	Measurements and Instrumentation	2	4	120	15	30	-	75
	Software Architecture	2	4	120	30	15	-	75
	Artificial Intelligence Techniques	2	4	120	45	-	-	75
	Mobile Applications Development	2	4	120	15	30	-	75

	Management, Leadership, and Academic Skills Modules (8 ECTS)							
	Developing, Funding and Commercialising Technology	2	4	120	60	-	-	60
	Academic English for Postgraduates (Engineering)	2	4	120	45	-	-	75
	Projects and Internships (2 ECTS)							
	Junior Internship	-	2	-	-	-	60	-

Semester	Subject	Coefficient	ECTS	Total Workload	Lecture / Tutorials	Lab	Project / Self-directed Study	Private Study
4	**Technical CORE Modules (24 ECTS)**							
	Mandatory Modules (16 ECTS)							
	Embedded Electronics and Communications	2	4	120	15	30	15	60
	Modeling and Simulation of Complex Systems	2	4	120	30	30	-	60
	Soft Computing	2	4	120	45	15	-	60
	Reconfigurable Computing Design	2	4	120	30	30	-	60
	Mandatory Elective Modules (4 ECTS) *Students must complete 1 course by 5 of 4 ECTS from those listed below*							
	Data Acquisition and Sensor Networks	2	4	120	15	30	-	75
	Machine Sensing	2	4	120	30	30	-	60
	Fault Diagnosis and Fault Tolerant Control	2	4	120	45	-	-	75
	Networked & Distributed Control Systems	2	4	120	45	-	-	75
	Power Electronics and Electrical Machines Control	2	4	120	30	30	-	60

	Elective Modules (4 ECTS) *Students must complete 1 course by 5 of 4 ECTS from those listed below*							
	Machine Learning	2	4	120	45	-	-	75
	Clouds, Grids and Virtualisation	2	4	120	30	15	15	60
	Distributed Systems	2	4	120	30	15	-	75
	Wireless Sensor Networks	2	4	120	25	20	-	75
	Wireless IoT and Local Area Networks	2	4	120	30	15	-	75
	Management, Leadership, and Academic Skills Modules (6 ECTS)							
	IT Project Management	1,5	3	90	30	15	15	30
	Research, Planning and Communication	1,5	3	90	30	-	-	60

Semester	Subject	Coefficient	ECTS	Total Workload	Lecture / Tutorials	Lab	Project / Self-directed Study	Private Study
5	**Technical CORE Modules (16 ECTS)**							
	Mandatory Modules 1 (4 ECTS)							
	Robotics Engineering	2,5	4	120	30	15	25	50
	Mandatory Elective Modules 1 (4 ECTS) *Students must complete 1 course by 5 of 4 ECTS from those listed below*							
	Control of Complex Systems	2,5	4	120	40	20	-	60
	Intelligent Control Systems	2,5	4	120	40	20	-	60
	Dynamic Programming & Stochastic Control	2,5	4	120	45	-	-	75
	Modeling and Control of Hybrid Systems	2,5	4	120	30	15	-	75
	Model Predictive Control	2,5	4	120	30	15	-	75
	Mandatory Elective Modules 2 (4 ECTS) *Students must complete 1 course by 5 of 4 ECTS from those listed below*							
	Quality Management	2,5	4	120	45	15	20	40
	Lean Management	2,5	4	120	45	15	20	40
	Production Planning and Control	2,5	4	120	45	-	15	60

	Logistics and Supply Chain	2,5	4	120	45	-	15	60
	Reliability and Maintenance Engineering	2,5	4	120	45	15	20	40
	Elective Modules (4 ECTS) *Students must complete 1 course by 5 of 4 ECTS from those listed below*							
	Neural Networks and Deep Learning	2	4	120	30	15	-	75
	Computer Vision and Pattern Recognition	2	4	120	30	15	30	45
	Multi-Agent Systems	2	4	120	45	-	-	75
	Intelligent Architectures	2	4	120	20	10	30	60
	Quantum Informatics	2	4	120	25	20	-	75
	Management, Leadership, and Academic Skills Modules (6 ECTS)							
	Mandatory Modules 2 (3 ECTS)							
	Legal and Ethical Aspects of Computer Science	1,5	3	90	45	-	-	45
	Mandatory Elective Modules 3 (3 ECTS) *Students must complete 1 course by 4 of 3 ECTS from those listed below*							
	Agile Leadership and Strategic Management	1,5	3	90	30	-	20	40
	Strategic Management of Technology and Innovation	1,5	3	90	30	-	20	40
	Transformational Change Management	1,5	3	90	30	-	20	40

	Organizational Behavior	1,5	3	90	30	-	20	40
	Projects and Internships (8 ECTS)							
	Mandatory Modules 3 (3 ECTS)							
	Senior Internship	-	3	90	-	-	90	-
	Mandatory Elective Modules 4 (5 ECTS) *Students must complete 1 course by 4 of 5 ECTS from those listed below*							
	Literature Survey	2,5	5	150	-	-	150	-
	Research Project Computer Science	2,5	5	150	-	-	150	-
	Joint Interdisciplinary Project (JIP)	2,5	5	150	-	-	150	-
	Interdisciplinary Advanced AI Project	2,5	5	150	-	-	150	-

Semester	Subject	Coefficient	ECTS	Total Workload	Lecture / Tutorials	Lab	Project / Self-directed Study	Private Study
6	**Projects and Internships (30 ECTS)**							
	Final Graduate Project	-	30	900	-	-	900	-