QF09/0413-4.0E	Study Plan for Master program - Study Plan Development and Updating Procedures/ Mechanical Engineering Department

Course Plan for Mechanical Engineering / Master of Science in Smart Manufacturing No.: (2023/2024)			
Approved by Deans Council by decision (2024-2023/05/27) dated (19/11/2023)			
(33) Credit Hours		Study system / hybrid program	
Type of specialty	☐ Humanitarian	✓- Scientific / technical	☐ Medical Sciences

Teaching style	Percentage of study plan hours / number	Model used (synchronous: asynchronous)
Complete e-learning courses	18% / number (6) Credit Hours	1:1
Blended Learning courses (For Humanity)	45% / number (15) Credit Hours	1:1
Blended learning courses (for scientific and medical)	45% / number (15) Credit Hours	1:1
Traditional learning courses (for humanity)	37% / number (12) Credit Hours	1:0
Traditional learning courses (for scientific and medical)	37% / number (12) Credit Hours	1:0

Important note: (The teaching patterns of the subjects are distributed at all academic levels in the program, and the Thesis hours are taught in a blended learning mode).

Program vision: Building specialized competencies in the field of Smart Manufacturing, provided with the knowledge, skills and leadership, creative and entrepreneurial competencies necessary to compete in the global labor market, through creative application in the use of information technology and modern teaching and learning strategies.

Program mission and objectives:

1. Achieving the conformity of the learning outcomes in all areas of specialization with the seventh level descriptors (knowledge, skills and competencies) in the National Qualifications Framework.
2. Integrating modern information technology and employing it creatively in the teaching and learning processes in order to achieve more effective learning and take into account the needs of the learner.
3. Promote the principle of self-sustainable, lifelong learning, and highlight the creativity of the learner in light of global changes through the application of various teaching and learning strategies.

Program learning outcomes (*(MK= Main Knowledge, MS= Main Skills, MC= Main Competences)*

Main knowledge	
MK1	Understand the basic principles and mathematical theories related to smart manufacturing
MK2	Possess general knowledge and various engineering tools to build successful pioneering engineering projects in the field of smart manufacturing
MK3	Familiarity with new sources of knowledge and findings of science in the field of smart manufacturing
Basic skills	
MS1	Ability to solve complex engineering problems by applying principal methods of engineering, science and mathematics
MS2	Ability to produce engineering designs within determinants to find specialized engineering solutions
MS3	Ability to analyze data and results using appropriate engineering experiments
MS4	Ability to evaluate and supervise technical design plans
General competencies	
MC1	Ability to assume ethical and professional responsibilities
MC2	Ability to apply leadership and communication skills within a team in the work environment
MC3	Ability to identify and address learning needs and engage in continuous learning
MC4	Ability to express and apply creative skills
MC5	Ability to manage mechanical engineering projects and realize their impact on society and environment

1. Master thesis program (33) credit hours:

Teaching style			Course No.	Course name	Credit hour	Indicative		Notes
Fully electronic learning	Blended learning	Traditional learning				Semester	year	
1. Mandatory requirements (18) credit hours								
•			0911741	Research Methodology	3	**1**	**1**	
		•	0911742	Manufacturing Control and Automation	3	**2**	**1**	
		•	0911744	Materials Selection for Design and Applica	3	**2**	**2**	
	•		0911745	Management of Global Manufacturing	3	**1**	**1**	
	•		0911753	Internet of Things in Advanced Manufacturing	3	**1**	**1**	
	•		0911754	Industry 4.0	3	3	2	
2. electives requirements (6) credit hours								
		•	0911743	Additive Manufacturing	3	3	1	
		•	0911746	Machine Learning and Data Science for Ma	3	3	2	
	•		0911747	Special Topics in Smart Manufacturing	3	3	1	
	•		0911750	Advanced Design and Manufacturing Processes	3	3	2	
	•		0911751	Molds and Die Design and Manufacturing	3	**1**	**1**	
		•	0911752	Systems Simulation & Modeling for Manufacturing	3	3	2	
•			0911755	Robotics Mechanics and Control	3	**2**	**2**	
3. Thesis (9) Credit Hours								

2. Comprehensive exam program (33) credit hours:

Teaching style			Course No.	Course name	Credit hour	Indicative		Notes
Fully electronic learning	Blended learning	Traditional learning				Semester	year	
1. Mandatory requirements (24) credit hours								
•			0911741	Research Methodology	3	1	1	
		•	0911742	Manufacturing Control and Automation	3	2	1	
		•	0911744	Materials Selection for Design and Applications	3	2	2	
	•		0911745	Management of Global Manufacturing	3	1	1	
		•	0911743	Advanced Design and Manufacturing Processes	3	3	1	
	•		0911747	Systems Simulation & Modeling for Manufacturing Processes	3	3	1	
	•		0911753	Internet of Things in Advanced Manufacturing	3	3	2	
	•		0911754	Industry 4.0	3	1	1	
2. Electives requirements (9) credit hours								
		•	0911746	Molds and Die Design and Manufacturing	3	3	2	
	•		0911751	Robotics Mechanics and Control	3	3	2	
•			0911755	Special Topics in Smart Manufacturing	3	3	2	
		•	0911752	Additive Manufacturing	3	1	1	
	•		0911750	Machine Learning and Data Science for Manufacturing Processes	3	2	2	
3. Passing comprehensive exam (0) credit hours								