

الخطة الدراسية - ماجستير

1.	School	School of Engineering
2.	Department	Industrial Engineering
3.	Program title (Arabic)	الماجستير في الهندسة الصناعية / الادارة الهندسية
4.	Program title (English)	Master of Science (M.Sc.) in Industrial Engineering/ Engineering Management
5.	Track	Thesis Track

	Specialization #	Degree	Dep #	Faculty #	Year	Track
Plan Number	Engineering Management	M.Sc.	06	09	2020	Thesis Track

First: General Rules & Conditions:

1. This plan conforms to the valid regulations of the programs of graduate studies.
2. Specialties of Admission:
 - The First Priority: Bachelor's in Industrial Engineering
 - The Second Priority: Bachelor's in Mechanical or Mechatronics Engineering
 - The Third Priority: Bachelor is in any other field of Engineering.

Second: Special Conditions: None.

Third: Study Plan: Studying (33) Credit Hours as following:

1. Obligatory Courses (15) Credit Hours:

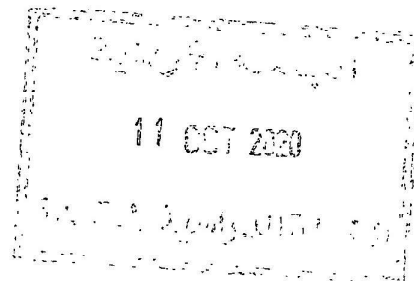
Course No.	Course Title	Credit Hrs	Theory	Practical.	Prerequisite
0936751	Scientific Research Methodology	3	3	-----	-
0906771	Advanced Operations Research Models	3	3	-----	-
0946702	Applied Engineering Statistics	3	3		-
0906772	Management and Quality Engineering	3	3	-----	0946702
0906773	Operations and Supply Chains Management	3	3	-----	0906771

2. Elective Courses: Studying (9) Credit hours from the following:

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Course No.	Course Title	Credit Hrs	Theory	Practical.	Prerequisite
0936705	Human Factors Engineering	3	3	-----	-
0936708	Systems Simulation	3	3	-----	0946702
0906775	Entrepreneurship and Management of Creativity and Innovation	3	3	-----	
0936706	Computer Integrated Manufacturing				
0946710	Engineering Economy	3	3	-----	
0936711	Project Management and Network Models	3	3	-----	
0906776	Managing Engineering and Technology and Facilities Planning	3	3	-----	-
0906777	Lean and Agile Management and Continuous improvements	3	3	-----	
0906778	Special Topics in Engineering Management	3	3	-----	-

3. Thesis: (9) Credit hours (0906799).



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4.	Program title (English)	Master of Science (M.Sc.) Degree in Industrial Engineering/ Engineering Management
5.	Track	Non-Thesis

	Specialization #	Degree	Dep #	Faculty #	Year	Track
Plan Number	Engineering Management	M.Sc.	06	09	2020	Non-Thesis

First: General Rules & Conditions:

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2. Specialties of Admission:
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 - The Second Priority: Bachelor's in Mechanical or Mechatronics Engineering
 - The Third Priority: Bachelor is in any other field of Engineering.

Second: Special Conditions: None.

Third: Study Plan: Studying (33) Credit Hours as following:

1. Obligatory Courses (24) Credit Hours:

Course No.	Course Title	Credit Hrs	Theory	Practical.	Prerequisite
0936751	Scientific Research Methodology	3	3	-----	-
0906771	Advanced Operations Research Models	3	3	-----	
0946702	Applied Engineering Statistics	3	3		
0906772	Management and Quality Engineering	3	3	-----	0946702
0906773	Operations and Supply Chains Management	3	3	-----	0906771
0936708	Systems Simulation	3	3	-----	0946702
0946710	Engineering Economy	3	3	-----	
0906777	Lean and Agile Management and Continuous improvements	3	3	-	-

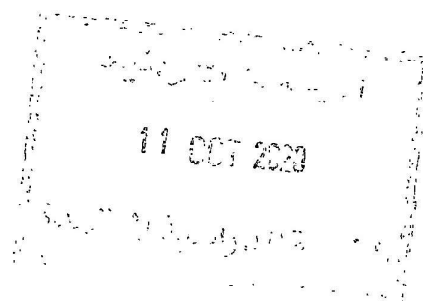
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2. Elective Courses: Studying (9) Credit hours from the following:

Course No.	Course Title	Credit Hrs	Theory	Practical.	Prerequisite
0906774	Human Factors Engineering	3	3	-----	-
0906775	Entrepreneurship and Management of Creativity and Innovation	3	3	-----	
0936706	Computer Integrated Manufacturing				
0936711	Project Management and Network Models	3	3	-----	
096776	Managing Engineering and Technology and Facilities Planning	3	3	-----	-
0906779	Strategic Management and planning	3	3	-----	
0906722	Knowledge Management and Data Science	3	3	-----	
0906778	Special Topics in Engineering Management	3	3	-----	-

3. Comprehensive Exam (0906798).



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Course Description

Course Number	Course Title	Credit Hours
0936751	Scientific Research Methodology	
Prerequisite: (-)		3
<p>Course Description:</p> <p>In this course students learn how to carry out different stages of scientific research starting from the formulation of research idea and finishing by a write up and presentation of a technical report. The course is in the form of lectures taught by faculty and invited speakers in which various types of research and different case studies. As part of the course, students will undertake at least one small research project under the supervision of faculty members to learn how to define the problem and complete the literature review using various resources including the Engineering Index Journal list and other relevant internet sources. Additionally, students will gain knowledge on using appropriate analytical and experimental methods in their projects. The general structure of their project reports will indicatively include the following sections: Abstract, Introduction, Analysis, and Description of the experiment, Experimental procedure, Results, Discussion, Conclusions, Recommendations and, finally, References.</p>		

Course Number	Course Title	Credit Hours
0906771	Advanced Operations Research Models	
Prerequisite: (-)		3
<p>Course Description:</p> <p>Concepts and models of deterministic operations research and related algorithms, Concepts and models of probabilistic and stochastic operations research and related algorithms, The algebraic forms of operations research models and solutions methods, The revised simplex algorithm, Nonlinear operations research models, Integer programming models and methods, Goal programming and methods, Dynamic programming and methods, Student may submit and discuss a real life project.</p>		

Course Number	Course Title	Credit Hours
0946702	Applied Engineering Statistics	
Prerequisite: (-)		3
<p>Course Description:</p> <p>Advanced topics on probability theory, theory of statistical inference, estimation, sampling distributions, tests of hypothesis, linear and non-linear regression. Analysis of variance and design of experiments. Case studies.</p>		

Course Number	Course Title	Credit Hours
0906772	Management and Quality Engineering	
Prerequisite: (0946702)		3
<p>Course Description:</p> <p>Total Quality Management. Acceptance sampling and control charting by both attributes and variables. Statistically and economically based treatments of sampling plans and control chart design, analysis & design of sampling under inspection and measurement errors.</p>		

Course Number	Course Title	Credit Hours
0906773	Operations and Supply Chains Management	

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Prerequisite: (0906771)	3
Course Description:	
Introduction to operations management and supply chains, analysis and control models of production systems and processes. Measuring the productivity of operations. Demand forecasting. Production planning and inventory control; Capacity planning, aggregate planning, and master production schedules (MPS), material requirement planning (MRP). Lean and agile culture, flexible and responsive supply chains, methodologies for continuous improvement and elimination of waste. Globalization and international trade, service and manufacturing supply chains, supply chain integration, dynamic change and supply chain acceleration, supply chain design and operation strategies, Logistics network design and, supplier relationship, customer relationship, transport and communications, Management planning, control and performance evaluation of supply chains and logistics networks, humanitarian and sustainable supply chains, ethics and environmental issues. Informatics and computerized applications, different cases and models.	

Course Number 0906774	Course Title Human Factors Engineering	Credit Hours 3
Prerequisite: (-)		3
Course Description:		
Human factors engineering (ergonomics), methods engineering, and work measurement. Human machine interface displays, controls, instrument layout, and supervisory control, Anthropometry, work physiology and biomechanics. Work environmental factors: noise, illumination, toxicology. Methods engineering, including operations analysis, motion study, and time standards.		

Course Number 0936708	Course Title Systems Simulation	Credit Hours 3
Prerequisite: (0946702)		3
Course Description:		
Introduction to discrete systems simulation using computer modelling to optimize system design. The concepts of queuing theory, random number generators, transactions, and facilities. Case studies and projects on discrete event system simulation.		

Course Number 0906775	Course Title Entrepreneurship and Management of Creativity and Innovation	Credit Hours 3
Prerequisite: (-)		3
Course Description:		
Innovation, creativity, entrepreneurship and its importance, the role of the individual and the organization in managing and leading it successfully. The course also shows the sources and reasons for innovation and creativity and how to search for opportunities, policies and strategies for innovation and creativity successfully. The course also addresses the difficulties and challenges of managing innovation, creativity, change and the impact of knowledge in overcoming them, opportunities to achieve innovation, creativity and change, how to manage innovation, creativity and change, and understanding the knowledge management necessary to achieve all of this. The drivers of innovation, creativity, and its effects on the success of small, medium, and large businesses.		

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Course Number	Course Title	Credit Hours
0936706	Computer Integrated Manufacturing	3
Prerequisite: (-)		3
<p align="center">Course Description:</p> <p>The course will cover topics that lead to Computer Aided Engineering: Manufacturing processes and systems, Computerized Numerical Control (CNC), Computer Aided Design and Computer Aided Manufacturing (CAD/CAM), Computer Aided Process Planning (CAPP), Computer aided testing and inspection, Group Technology (GT) and flexible manufacturing system (FMS), Remote manufacturing and Rapid prototyping, Automated material handling systems, and Robotics.</p>		

Course Number	Course Title	Credit Hours
0946710	Engineering Economy	3
Prerequisite: (-)		3
<p align="center">Course Description:</p> <p>Basic economics topics include contrasting macro and micro economics; gross domestic product; economic growth and business cycles; unemployment and inflation; aggregate supply and demand; scarcity, opportunity costs, and trade; law of supply and demand; accounting versus economic profits; money and exchange rates; government choices, markets, efficiency, and equity; monopoly and competition. Engineering economy topics include the basic concepts of the time value of money and economic equivalence; different economic analysis methods, i.e., present worth, annual-equivalent worth, rate-of-return, life-cycle cost, and cost/benefit in evaluating the economic viability of a project, as well as the comparison of alternatives. The course also introduces concepts of replacement decisions, and capital-budgeting decisions.</p>		

Course Number	Course Title	Credit Hours
0936711	Project Management and Network Models	3
Prerequisite: (-)		3
<p align="center">Course Description:</p> <p>This is a capstone course to provide students with a comprehensive integrated look into the Project Management (PM) knowledge and application according to the Project Management Institute (PMI) using the Project Management Body of Knowledge Book (PMBOK). The course will cover the five PM Process Groups; Initiation, Planning, Execution, Monitoring & Controlling, and Closure. The different project knowledge areas including Scope, Time, Cost, Quality, Human Resources, communication, Procurement, Stakeholders, and Risk will be addressed. Students will go through PM simulation cases and should have a feeling for the real project management environment.</p>		

Course Number	Course Title	Credit Hours
0906776	Managing Engineering and Technology and Facilities Planning	3
Prerequisite: (-)		3
<p align="center">Course Description:</p> <p>The origin of engineering practice, management and engineering management, historical development in engineering management, functions of technology management, the planning process, the nature of</p>		

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decision making process, the nature of organizing process, concepts for motivating and leading technical people, the process of Control. Strategic Facilities Planning, Location Selection. Product, Process and schedule Design. Flow, Space and Activity Relationships, Personnel Requirements. Material Handling. Layout, Computer-Aided Layout. Warehouses design and management.

Course Number	Course Title	Credit Hours
0906777	Lean and Agile Management and Continuous improvements	

Prerequisite: (-)

3

Course Description:

Multidimensional culture of lean thinking and its applications, philosophy of lean management, philosophy of agility and its industrial applications, productivity-quality relationships and their improvement's programs, Push and pull production systems, waste and its causes and waste elimination methodologies, the most important tools, methods and practices of lean and agility; Six Sigma, 5S, JIT systems and its applications (Toyota), shop floor control policies, Kanban, avoiding mistakes (Poka Yoka), Intelligent systems, Value Stream Mapping, production smoothening, etc. The course includes an analysis of real practical cases.

Course Number	Course Title	Credit Hours
0906778	Special Topics in Engineering Management	

Prerequisite: (-)

3

Course Description:

Selected topics of current interest in Engineering Management. The course is designed to give the students an opportunity to pursue special studies not offered in other courses.

Course Number	Course Title	Credit Hours
0906779	Strategic Management and planning	

Prerequisite: (-)

3

Course Description:

Strategic management focuses on the concept of strategy formulation and implementation by exploring the functions and nature of general management. The course serves as an opportunity to develop skills for strategic thinking and analysis, leadership, communication, teamwork, and cross-functional integration. Students learn about corporate and business planning and the implementation of organizational change through structures, systems, and people. The approach adopted includes lectures, case analyses and action learning through group efforts.

Course Number	Course Title	Credit Hours
0906722	Knowledge Management and Data Science	

Prerequisite: (-)

3

Course Description:

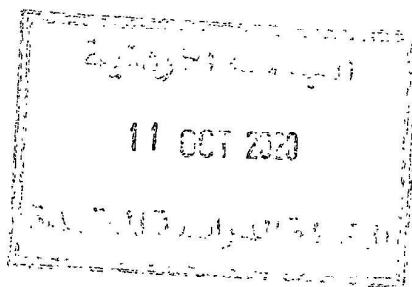
Knowledge and data science Definitions and Classifications, Data science and Methods of knowledge acquisition, data science and knowledge generation principles, database design and usage in organizations, Computer aided knowledge systems, artificial intelligence and its application in knowledge management and data science.

Course Number	Course Title	Credit
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0906799	Thesis	Hours
Prerequisite: (JU regulations)		9
<p>Course Description: Preparing a thesis that includes scientific studies aimed at finding solutions to scientific problems of a practical multi-dimensional engineering nature, within the scope of industrial engineering, the thesis should express an integrated set of sequential and systematic scientific steps, which are based on information related to the problem of study with the aim of finding a reasonable solution using a scientific method that enriches human knowledge.</p>		

Course Number	Course Title	Credit Hours
0906798	Comprehensive Exam	
Prerequisite: (JU regulations)		-
<p>Course Description: A specialized committee prepares a comprehensive exam within the scope of the program where the student is subjected to this exam and the instructions of the graduate studies in force apply all the relevant procedures.</p>		



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The Transition Plan

Courses will be offered according to this revised form of the plan 2019/2020. The table below will be applied to substitute for what is matched in this plan for the students admitted based on the old plan.

This Plan (2020/2021)			Old plan		
Course No	Replaced Course Title	Credit Hrs	Course No	Course Title	Credit Hrs
0906771	Advanced Operations Research Models	3	0906701	Operations Research	3
0906772	Management and Quality Engineering	3	0906703	Industrial Quality Control	3
0906773	Operations and Supply Chains Management	3	0906704	Production Planning and Control	3
0906774	Human Factors Engineering	3	0906705	Human Factors	3
0906777	Lean and Agile Management and Continuous improvements	3	0906721	Design and Analysis of Production Systems	3
0906725	Knowledge Management and Data Science	3	0906725	Knowledge Management	3
	Elective	3	0906709	Information Systems Analysis and Design	3
	Elective	3	0906728	Industrial Health and Safety Engineering	3
	Elective	3	0906737	Product Development	3
	Elective	3	0906712	Artificial Intelligence	3
	Elective	3	0906713	Methods Engineering and Work Measurement	3

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