Design and Production Engineering Program

Program Description

The Design and Production Engineering program prepares students for entry level professional practice in mechanical design and production engineering, both locally and internationally.

The Design and Production Engineering program is one of the oldest engineering programs in Egyptian universities. The program flourished with the boom in Egyptian industry during the sixties of the twentieth century. Recently, there is an increasing need for the modernization of industry in Egypt to cope with the global challenges of designing and producing cost effective products that can compete with the international market. Consequently, the Design and Production Engineering program needs to be modernized as well. The program developed at Ain Shams University equip students with necessary competencies contemporary to the current industry. It also inspires graduates for self-learning to cope with the requirements of ever-changing career path after their graduation.

Career Prospects

Design and Production Engineering is one of the most recognized disciplines in Egyptian industry. Design and Production engineers are needed in many industries aiming to design and produce all kinds of products, machines and equipment. Graduates work in all industrial sectors including engineering, metallurgical, petrochemical, textiles, furniture, etc. They can work as engineers in research and development, operations management, quality control, tool design, work study, cost analysis, process control, heat treatment, etc.

Graduates can be specialized in a specific field of the following concentrations: Manufacturing engineering, Mechanical design, Industrial engineering and operations management, or Materials engineering.

Required Courses

In order to get a Bachelor of Science Degree in this program, and to satisfy the Program Competences, the following set of courses need to be completed.

Code	Course Title	Credits and SWL			Contact Hours			
		CH	ECTS	SWL	Lec	Tut	Lab	TT
	Ain Shams University Requirements	14	17	425	12	6	0	18
	Faculty of Engineering Requirements	42	76	1900	34	23	14	71
	Mechanical Engineering Requirements	63	110	2750	48	33	23	104
MDP312	Mechanical System Design	3	5	125	2	2	2	6
MDP381	Theory of Metal Forming	3	5	125	2	2	1	5
MDP382	Theory of Metal Cutting	3	5	125	2	2	1	5
MDP383	Metal Forming Technology, Machines and Dies	3	5	125	2	2	1	5
MDP384	Metal Cutting Machines and Technology	3	6	150	2	2	2	6
MDP481	Design of Tools and Production Facilities	3	4	100	2	2	0	4
MDP482	Metrology and Measuring Instruments	4	8	200	3	0	5	8
MDP483	Computerized Numerical Control Machines	2	4	100	2	1	1	4
MDP332	Work Study	3	6	150	2	2	0	4
MDP333	Operations Research	3	6	150	2	2	0	4
MDP431	Operations Management	3	6	150	2	2	0	4
MDP432	Facilities Planning	3	7	175	2	2	0	4
MDP433	Quality Control	3	5	125	2	2	0	4
	Design and Production Concentration Elective (1)	3	5	125	2	2	1	5
	Design and Production Concentration Elective (2)	3	5	125	2	2	1	5
MDP401	Design and Production Engineering Graduation Project (1)	3	6	150	1	0	6	7
MDP402	Design and Production Engineering Graduation Project (2)	3	6	150	1	0	6	7
	Program Requirements Total	170	297	7425	127	89	64	280
Pool of Mechanical Design Concertation Elective Courses								
MDP411	Introduction to Finite Elements	3	5	125	2	2	0	4
MDP412	Noise and Vibration Control	3	5	125	2	2	1	5
MDP413	Design Optimization	3	5	125	3	1	1	5
MDP414	Product Design and Development	3	5	125	2	2	2	6
MDP415	Selected Topics in Mechanical Design	3	5	125	2	2	1	5
Pool of Industrial Engineering Concertation Elective Courses								
MDP434	Quality Systems and Assurance	3	5	125	2	2	0	4
MDP435	Industrial Systems Modelling and Simulation	3	5	125	2	0	3	5
MDP436	Production Planning and Control	3	5	125	2	2	0	4
MDP437	Ergonomics	3	5	125	2	2	0	4
Pool of Materials Engineering Concertation Elective Courses								
MDP256	Phase Transformation and Heat Treatment	3	5	125	2	2	2	6
MDP451	Failure Analysis	3	5	125	3	0	1	4
MDP452	Material and Process Selection	3	5	125	3	0	1	4
MDP453	Composites Technology	3	5	125	3	0	1	4
MDP454	Corrosion	3	5	125	3	0	1	4
MDP455	Renewable Materials	3	5	125	2	2	2	6
Pool of Manufacturing Concertation Elective Courses								

MDP484	Product Life Cycle Management	3	5	125	2	1	2	5
MDP485	Advanced Topics in CNC Machine Tools	3	5	125	2	2	1	5
MDP486	Selected Topics in Manufacturing	3	5	125	2	1	2	5
MDP487	Computer Integrated Manufacturing	3	5	125	2	2	1	5
MDP488	Advanced Manufacturing Technology	3	5	125	2	2	0	5
MDP489	Selected Topics in Metal Forming	3	5	125	2	1	2	4

Proposed Study Plan

Code	Course Title	Credits and SWL			Contact Hours				Pre-requisites
		CH	ECTS	SWL	Lec	Tut	Lab	TT	
Semester 1									
PHM012	Mathematics (1)	3	5	125	3	2	0	5	Eng/Math
PHM021	Vibration and Waves	3	5	125	3	1	1	5	Eng/Math
PHM031	Statics	3	5	125	2	2	1	5	Eng/Math
MDP011	Engineering Drawing	3	6	150	1	3	2	6	
PHM041	Engineering Chemistry	3	5	125	2	1	2	5	Eng
CSE031	Computing in Engineering	2	4	100	2	0	0	2	
Total		17	30	750	13	9	6	28	
Semester 2									
PHM013	Mathematics (2)	3	5	125	3	2	0	5	PHM012
PHM022	Electricity and Magnetism	3	5	125	3	1	1	5	Eng/Math
PHM032	Dynamics	3	5	125	2	2	1	5	PHM031
CEP011	Projection and Engineering Graphics	3	6	150	1	3	2	6	
MDP081	Production Engineering	3	5	125	2	0	3	5	Eng
ENG011	Fundamentals of Engineering	2	4	100	2	1	0	3	
Total		17	30	750	13	9	7	29	
Semester 3									
PHM111	Probability and Statistics	2	4	100	2	2	0	4	PHM013
MDP151	Structures and Properties of Materials	2	4	100	2	1	1	4	PHM041
MDP111	Mechanical Engineering Drawing	3	6	150	1	3	2	6	MDP011
MDP181	Manufacturing Technology (1)	3	5	125	3	0	2	5	MDP081
MEP111	Thermal Physics	2	4	100	1	2	0	3	
EPM116	Electrical Circuits and Machines	4	6	150	3	2	1	6	PHM022
Total		16	29	725	12	10	6	28	
Semester 4									
PHM112	Differential Equations and Numerical Analysis	4	6	150	3	2	0	5	PHM013
PHM131	Rigid body dynamics	2	4	100	2	1	1	4	PHM032
MDP112	Machine Construction	3	5	125	2	2	0	4	MDP111
MDP152	Metallurgy and Material testing	3	5	125	3	1	1	5	MDP151
MEP211	Thermodynamics	4	6	150	3	2	1	6	MEP111
ECE215	Introduction to Electronics	2	4	100	2	1	1	4	PHM022
Total		18	30	750	15	9	4	28	
Semester 5									
MDP231	Engineering Economy	2	4	100	2	1	0	3	
MDP212	Mechanics of Machines	4	6	150	3	3	1	7	PHM131
MDP211	Machine Elements Design	4	8	200	3	2	2	7	MDP112
MEP221	Fluid Mechanics and Turbomachinery	4	7	175	3	2	1	6	PHM112
MEP231	Measurement and Instrumentation	2	5	125	1	0	3	4	
Total		16	30	750	12	8	7	27	