



Ain Shams University Faculty of Engineering Specialized Credit Hours Programs (S-CHEP)

Design and Production Engineering Program

2018/2019



Program Specifications Competences BasedUniversity: Ain ShamsFaculty: Engineering

A- Basic Information

- **1.** Programme title:
- 2. Programme type:
- 3. Faculty:
- **4.** Department(s) offering the Program:
- 5. Coordinator:
- **6.** External evaluator(s):
- 7. Internal Evaluator:
- 8. Date of program bylaw approval:
- 9. Date of program specifications approval:

B. SC. in Design and Production Engineering

Single Double Multiple Saculty of Engineering – Ain Shams University Design and Production Engineering Prof. Adel Elsabbagh Prof. Shaaban Abdo Prof. Mostafa Chaaban 2018 September 2021

B- Professional Information

1. Program Mission

The mission of the Design and Production Engineering program is to provide quality learning that is driven by a professional and technology-oriented focus and highly committed to innovation and industrialization. The department is devoted to educating and inspiring future generations of mechanical design and production engineers who are both technically skilled and ethically professional. The program is therefore based on the following intentions:

- PM1. Prepare students for a professional career with a broad knowledge of basic and practical mechanical engineering with high emphasis on the different aspects of production engineering; material technology, mechanical design, manufacturing processes and industrial aspects.
- PM2. Conduct engineering research and to pursue graduate degrees in the above fields
- PM3. Achieve leadership positions in scientific and technological enterprises in Egypt and globally.
- PM4. Compete internationally in the fields of mechanical design and production engineering.
- PM5. Behave ethically based on the professional principles.

2. Program Aims

The main aims of the "Design and Production Engineering" program at the "Faculty of Engineering" in "Ain Shams University" are to equip the student with the proper scientific knowledge and develop his/her skills to::

- PA 1. Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.
- PA 2. Design a system; component and process to meet the required needs within realistic constraints.
- PA 3. Design and conduct experiments as well as analyse and interpret data.



- PA 4. Identify, formulate and solve fundamental engineering problems.
- PA 5. Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
- PA 6. Work effectively within multi-disciplinary teams.
- PA 7. Communicate effectively.
- PA 8. Consider the impacts of engineering solutions on society & environment.
- PA 9. Demonstrate knowledge of contemporary engineering issues.
- PA 10. Display professional and ethical responsibilities; and contextual understanding
- PA 11. Engage in self- and life- long learning.
- PA 12. Work with mechanical design and manufacturing systems.
- PA 13. Use of mathematics and physical and engineering sciences and systems analysis tools in products, components and machines design, and/or the manufacturing of such products, components and machines.
- PA 14. Use different instruments, devices and tools appropriately and carry-out wide range of experiments, automatic data acquisition, data analysis and interpretation, and data presentation, both orally and in the written form.
- PA 15. Use the computer software for design, communication and visualization.
- PA 16. Use and/or develop computer software, necessary for the design, manufacturing and management of industrial systems and projects.
- PA 17. Analyze multi-disciplinary mechanical, electrical, electronic, thermal and hydraulic systems.
- PA 18. Lead and supervise groups of designers, technicians and other work force.

3. Graduate attributes

Graduates of the Design and Production Engineering Program at Ain Shams University are able to work professionally in industry equipped with the following skills:

- GA 1- Implement basic theories to production processes including new technologies in manufacturing to select proper processes and process parameters for specific products.
- GA 2- Design systems, machines, tools, and products implementing proper standards and developing the necessary calculations, construction and working drawings
- GA 3- Implement basics of industrial engineering to analyze, plan and design production systems.
- GA 4- Select materials suitable for specific applications.

4. Program Competencies

Considering NARS 2018, any program competencies are classified into three categories: <u>General</u> <u>competencies</u>, <u>Speciality Competencies</u>, and either <u>Sub-Speciality</u> or <u>Inter-Disciplinary competencies</u>. For the Design and Production Engineering program, and in light of NARS 2018, the program competences are categorised into four categories:



- <u>The "Zero" level</u>: This category is planned to accommodate a single general competence that expresses the basic and general competence any university graduate should be characterised whatever his/her speciality is,
- <u>The "A" level</u>: This category is planned to accommodate the competencies that any engineering graduate should be characterised with,
- <u>The "B" level</u>: In this case, the category of competencies for any Mechanical engineer,
- <u>The "C" level</u>: This category specifies the competencies for any Design and Production Engineering graduate.

Based on that the program graduate must be able to:

<u>0. General Common Competences</u>

A0- Illustrate a fair awareness of national, regional and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.

A. General Competences

The program graduates possess the necessary attributes for engineers in general, proposed in NARS-2018, including:

- A1- Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
- A2- Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
- A3- Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
- A4- Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- A5- Practice research techniques and methods of investigation as an inherent part of learning.
- A6- Plan, supervise and monitor implementation of engineering projects.
- A7- Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.
- A8- Communicate effectively graphically, verbally and in writing with a range of audiences using contemporary tools.
- A9- Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
- A10- Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

B. Mechanical Engineering Competences



The program graduates possess the necessary attributes for mechanical engineers, clearly identified by NARS-2018, including:

- B1m. Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, Solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.
- B2m. Design mechanical systems and machine elements using appropriate materials using traditional means, computer-aided tools and software contemporary to the mechanical engineering field.
- B3m. Select conventional mechanical equipment according to the required performance.
- B4m. Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain mechanical equipment and systems.

<u>C. Design and Production Engineering Competences</u>

Graduates of the Design and Production Engineering Program at Ain Shams University are able to work professionally in industry equipped with the following skills:

- C1. Implement basic theories to production processes including new technologies in manufacturing to select proper processes and process parameters for specific products.
- C2. Design systems, machines, tools, and products implementing proper standards and developing the necessary calculations, construction and working drawings
- C3. Implement basics of industrial engineering to analyze, plan and design production systems.
- C4. Select materials suitable for specific applications.
- C5.Program graduates at Ain Shams University, can be specialized in one of the concentrations within the Design and Production Engineering program through two elective courses and graduation project. The proposed concentrations and resulting graduate attributes are:
 - C5a. Manufacturing Demonstrate additional abilities to select and link different manufacturing processes to certain design requirement to achieve desired levels of quality, product and process performance .
 - C5b. Mechanical design Demonstrate additional abilities to model, analyze, and design mechanical components and systems using the most up-to-date tools of integrated systems.
 - C5c. Industrial engineering Demonstrate additional abilities to analyze, design, integrate, operate, evaluate, control, automate, and implement methods and techniques to manage industrial systems .
 - C5d. Materials engineering Demonstrate additional abilities to select, prepare, analyze, treat, and test materials for specific applications.



5. Academic standards

The "<u>Design and Production Engineering</u>" program ADOPTS the National Academic Reference Standards (NARS) for Engineering 2nd ed. Issued in 2018.

- See Table [1] for a relationship matrix of "Institute's Mission Vs Program's Mission".
- See Table [2] for a relationship matrix of "Program's Mission Vs Graduate's attributes".
- See Table [3] for a relationship matrix of "Program Aims Vs Program Graduate's Attributes".
- See Table [4] for a relationship matrix of "Graduate's Attributes Vs Program Competences ".
- See Table [5] for a relationship matrix of "Program Competences Vs Program's Courses".

6. Curriculum structure and contents

a- Programme duration:

5 years / 10 semesters, - 170 credit hours

b- Programme structure

	Credits and SW	L				
СН	ECTS	SWL	Lec	Tut	Lab	TT
170	297	7425	127	89	64	280
Compulso	ry 154 CH	Elective	16 CH	Optional	I/Selective	16 CH

	Subject Area	NARS%	Program%
Α	Humanities and Social Sciences (Univ. Req.)	8-12 %	9.36 %
В	Business Administration	2-4 %	4.09%
С	Mathematics and basic sciences	18-22 %	22.22%
D	Engineering Knowledge	4-6 %	4.68%
Е	Basic Engineering Sciences	25-30 %	28.07%
F	Engineering Applications and Designs	25-30 %	27.19%
G	Project and Field Training	4-6 %	4.39%
	Total		100%

See appendix - Table [6] for courses classification according to subject area.

c- <u>Programme courses</u>

i. <u>University Requirements</u>

			Cre	edits &	SWL	Co	ontact	: Hou	rs
#	Code	Course Title	C H	ECTS	SWL	Lec	Tut	Lab	TT
1	ASU011	Technical English Language	0	4	100	2	2	0	4
2	ASU111	Human Rights	2	2	50	2	1	0	3
3	ASU112	Report Writing and Communication skills	3	4	100	2	2	0	4
4	ASU113	Professional Ethics and Legislations	3	4	100	2	2	0	4



			Cre	edits &	SWL	Co	ontact	: Hou	rs
#	Code	Course Title	C H	ECTS	SWL	Lec	Tut	Lab	тт
5	ASU114	Selected Topics in Contemporary Issues	2	2	50	2	0	0	2
	-	ASU Elective (1)	2	3	75	2	1	0	3
	-	ASU Elective (2)	2	2	50	2	0	0	2
		Total	14	17	425	12	6	0	18
	Pool of ASU El	ective (1) Courses							
6	ASU321	Innovation and Entrepreneurship	2	3	75	2	1	0	3
7	ASU322	Language Course – can accept equivalent certificates	2	3	75	2	1	0	3
8	ASU323	Introduction to Accounting	2	3	75	2	1	0	3
9	ASU324	History of Engineering and Technology	2	3	75	2	1	0	3
	Pool of ASU El	ective (2) Courses							
10	ASU331	Human Resources Management	2	2	50	2	0	0	2
11	ASU332	History of Architecture	2	2	50	2	0	0	2
12	ASU333	Introduction to Marketing	2	2	50	2	0	0	2
13	ASU334	Building Safety and Fire Protection		2	50	2	0	0	2
14	ASU335	Literature and Arts	2	2	50	2	0	0	2
15	ASU336	Business Administration	2	2	50	2	0	0	2

i. Faculty Requirements (Level A)

Code	Course Title	Cre SW	dits an L	d	Contact Hours					
		CH	ECT S	SWL	Lec	Tut	Lab	TT		
PHM011	Basic Mathematics	0	4	100	2	2	0	4		
ENG111	Field Training	0	12	300	0	10	15	25		
PHM012	Mathematics (1)	3	5	125	3	2	0	5		
PHM013	Mathematics (2)	3	5	125	3	2	0	5		
PHM021	Vibration and Waves	3	5	125	3	1	1	5		
PHM022	Electricity and Magnetism	3	5	125	3	1	1	5		
PHM031	Statics	3	5	125	2	2	1	5		
PHM032	Dynamics	3	5	125	2	2	1	5		
PHM041	Engineering Chemistry	3	5	125	2	1	2	5		
PHM111	Probability and Statistics	2	4	100	2	2	0	4		
MDP081	Production Engineering	3	5	125	2	0	3	5		
MDP011	Engineering Drawing	3	6	150	1	3	2	6		
CEP011	Projection and Engineering Graphics	3	6	150	1	3	2	6		
CSE031	Computing in Engineering	2	4	100	2	0	0	2		
ENG011	Fundamentals of Engineering	2	4	100	2	1	0	3		
-	Structures and Properties of Materials Elective	2	4	100	2	1	1	4		
-	Engineering Economy Elective	2	4	100	2	1	0	3		
-	Project Management Elective	2	4	100	2	1	0	3		
	Total	42	76	1900	34	23	14	71		
Pool of Strue	ctures and Properties of Materials Elective Courses									
MDP151	Structures and Properties of Materials	2	4	100	2	1	1	4		
EPM211	Properties of Electrical Materials	2	4	100	2	1	1	4		
CES151	Structures and Properties of Construction Materials	2	4	100	2	1	1	4		
Pool of Engi	neering Economy Elective Courses									
MDP231	Engineering Economy	2	4	100	2	1	0	3		
ARC471	Feasibility Studies	2	4	100	2	1	0	3		



ARC463	Renewable Energy Systems and Economics	2	4	100	2	1	0	3
UPL271	Society and Housing Economics	2	4	100	2	1	0	3
UPL471	Urban Economics	2	4	100	2	1	0	3
EPM119	Engineering Economy and Investments	2	4	100	2	1	0	3
CEI261	Engineering Economics and Management	2	4	100	2	1	0	3
CES171	Engineering Economics and Finance	2	4	100	2	1	0	3
Pool of Proj	ect Management Elective Courses							
Pool of Proj MDP232	ect Management Elective Courses Industrial Project Management	2	4	100	2	1	0	3
Pool of Proj MDP232 ARC371	ect Management Elective Courses Industrial Project Management Architecture Project Management	2	4	100 100	2 2	1	0 0	3
Pool of Proj MDP232 ARC371 EPM411	ect Management Elective Courses Industrial Project Management Architecture Project Management Project Management for Electrical Engineering	2 2 2	4 4 4	100 100 100	2 2 2	1 1 1	0 0 0	3 3 3
Pool of Proj MDP232 ARC371 EPM411 CSE441	ect Management Elective Courses Industrial Project Management Architecture Project Management Project Management for Electrical Engineering Software Project Management	2 2 2 2	4 4 4 4	100 100 100 100	2 2 2 2 2	1 1 1 1	0 0 0 0	3 3 3 3

ii. Mechanical Engineering Discipline Requirements (Level B)

Code	Course Title	Cre SW	dits an L	d	(Contae	et Ho	ırs
		C H	ECT S	SWL	Lec	Tut	Lab	TT
PHM112	Differential Equations and Numerical Analysis	4	6	150	3	2	0	5
PHM131	Rigid body dynamics	2	4	100	2	2	0	4
MEP111	Thermal Physics	2	4	100	1	2	0	3
MEP211	Thermodynamics	4	6	150	3	2	1	6
MEP212	Heat Transfer	4	8	200	2	2	3	7
MEP221	Fluid Mechanics and Turbomachinery	4	7	175	3	2	1	6
MEP231	Measurement and Instrumentation	2	5	125	1	0	3	4
MDP111	Mechanical Engineering Drawing	3	6	150	1	3	2	6
MDP112	Machine Construction	3	5	125	2	2	0	4
MDP211	Machine Elements Design	4	8	200	3	2	2	7
MDP212	Mechanics of Machines	4	6	150	3	3	1	7
MDP311	Mechanical Vibrations	4	7	175	3	2	1	6
MDP152	Metallurgy and Material Testing	3	5	125	3	1	1	5
MDP251	Casting and Welding (1)	3	4	100	2	2	1	5
MDP181	Manufacturing Technology (1)	3	5	125	3	0	2	5
MCT211	Automatic Control	3	5	125	3	1	1	5
MCT311	Hydraulics and Pneumatics Control	3	5	125	3	1	1	5
EPM116	Electrical Circuits and Machines	4	6	150	3	2	1	6
ECE215	Introduction to electronics	2	4	100	2	1	1	4
	Mechanical Engineering Requirement Elective	2	4	100	2	1	1	4
	Total	63	110	2750	48	33	23	104
Pool of Mec	hanical Engineering Requirement Elective							
MDP331	Maintenance Planning and Scheduling	2	4	100	2	1	0	3
MEA261	Introduction to Automotive	2	4	100	2	0	2	4
MCT312	Industrial Automation	2	4	100	2	1	1	4

iii. Design and Production Engineering Program (Sub-Speciality) Requirements (Level C)

Codo	Course Title		its and	SWL	Contact Hours				
Coue	Course Inte	СН	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	2	5	125	2	2	2	6
				125	-	2	~	-
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	2	6	150	1	0	6	7
10101 401	Project (1)	5	Ū	150	-	U	Ŭ	,
MDP402	Design and Production Engineering Graduation	3	6	150	1	0	6	7
	Project (2)							
	Program Requirements Total	170	297	7425	127	89	64	280
Pool of Mec	hanical 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 Indu	strial 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 Mate	erials 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 Man	ufacturing 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



d- Proposed Study Plan:

Codo	Course Title	Credits and SWL			Contact Hours				Pre-
Coue	course ritie	CH	ECTS	SWL	Lec	Tut	Lab	TT	requisites
	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					T	1	
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	



		Cre	dits an	d SWL	Co	ontact	Pre-		
Code	Course litle	СН	ECTS	SWL	Lec	Tut	Lab	TT	requisites
	Semester	6					•		
MDP232	Industrial Project management	2	4	100	2	1	0	3	
MDP251	Casting and Welding (1)	3	4	100	2	2	1	5	MDP152
MDP311	Mechanical Vibrations	4	7	175	3	2	1	6	PHM131
MEP212	Heat Transfer	4	8	200	2	2	3	7	MEP211
MDP331	Maintenance Planning and Scheduling	2	4	100	2	1	0	3	
ASU112	Report Writing and Communication skills	3	4	100	2	2	0	4	
	Total	18	31	775	13	10	5	28	
	Semester	7							
MDP333	Operations Research	3	6	150	2	2	0	4	PHM013 PHM111
MCT211	Automatic Control	3	5	125	3	1	1	5	PHM112
	ASU Elective (1)	2	2	50	2	1	0	3	
MDP312	Mechanical System Design	3	5	125	2	2	2	6	MDP211
MDP383	Metal Forming Technology, Machines and Dies	3	5	125	2	2	1	5	MDP181
MDP384	Metal Cutting Machines and Technology	3	6	150	2	2	2	6	MDP181 MDP211
	Total	17	29	725	13	10	6	29	WD1211
	Semester	8	23	725	13	10		25	
MDP381	Theory of Metal Forming	3	5	125	2	2	1	5	MDP181
MDP382	Theory of Metal Cutting	3	5	125	2	2	1	5	MDP181
MDP332	Work Study	3	6	150	2	2	0	4	PHM111
MCT311	Hydraulics and Pneumatics Control	3	5	125	3	1	1	5	MEP221
	Concentration Elective (1)	3	5	125	2	2	1	5	
ASU	ASU Elective (2)	2	2	50	2	0	0	2	
	Total	17	28	700	13	9	4	26	
	Semester	9	1	1		1	1		
MDP483	Computerized Numerical Controlled Machines	2	4	100	2	1	1	4	MDP382
MDP482	Metrology and Measuring Instruments	4	8	200	3	0	5	8	
MDP431	Operations Management	3	6	150	2	2	0	4	MDP231
	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	Elec. (1)
ASU114	Selected Topics in Contemporary Issues	2	2	50	2	0	0	2	
	Total	17	31	775	12	5	13	- 30	
	Semester	10							
ASU111	Human Rights	2	2	50	2	1	0	3	
MDP432	Facilities Planning	3	7	175	2	2	0	4	MDP332
MDP433	Quality Control	3	5	125	2	2	0	4	PHM111
MDP481	Design of Tools and Production Facilities	3	4	100	2	2	0	4	MDP382
MDP402	Design and Production Engineering Graduation	3	6	150	1	0	6	7	MDP401
ASI 1112	Professional Ethics and Legislations	2	Д	100	2	2	0	Δ	
7.00110	Total	17	28	700	- 11	9	6	26	



7. Program admission requirements

Program admission rules are illustrated in the bylaw (2018) articles 9 to 13. Please check appendix #2.

8. Regulations for progression and program completion

Program progression and completion rules are illustrated in the bylaw (2018) articles 14 to 34. Please check appendix #2

9. Program Assessment Methods

Considering that the program competences illustrate a wholistic status that would be achieved through a journey involves many different courses within different levels, and the final competence achievement can only be assessed at the end of its journey, each single competence is broken-down into measurable Learning Outcomes that should be achieved in different courses. Thus, the program graduate competence may be considered as the final goal, while the courses LOs may be considered as the procedural aims/objectives.

Hence, different assessment methods are applied in program courses to assess these procedural aims/objectives. The following table illustrates the assessment methods and what they assess in most cases. For further details refer to the courses' specifications.

Assessment		LOs Don	nains
Typology	Cognitive	Psychomotor	Affective
Written Exams			
Practical Exams			
Oral Exams			
Projects			
Research			

10. Evaluation of program intended learning outcomes

Evaluator	Tool	Sample
1-Senior students	Evaluation sheet	50%
2-Alumni	Evaluation sheet & interview	10%
3-Stakeholders (Employers)	Evaluation sheet & interview	A representative sample
4-External and internal Evaluators	Evaluation report	1 for each
5- Other: Specialized Faculty Members	Evaluation sheet	50%



Appendix #1

Table [1] The relationship matrix of "Institute's Mission Vs Program's Mission" and The relationship matrix of "Program's Mission Vs Program Aims".

Th	e Fac	ulty of Engineering - Ain Shams University is a		Progra	m's Missio	on (PM)	
na	tional	ly and regionally renowned institution in:	PM 1	PM 2	PM 3	PM 4	PM 5
ĺΣ	IM 1	Graduating talented engineers capable of innovating, and					
Aission (IM 2	Keeping abreast of the global development at engineering disciplines,					
e's N	1M 3	to meet the needs of regional and international employment markets and entrepreneurship.					
Institut	IM 4	It also develops scientific and engineering knowledge to meet the needs of society and sustainable development goals.					
			PM 1	PM 2	PM 3	PM 4	PM 5
	PA 1	Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.					
	PA 2	Design a system; component and process to meet the required needs within realistic constraints.					
	PA 3	Design and conduct experiments as well as analyse and interpret data.					
	PA 4	Identify, formulate and solve fundamental engineering problems.					
(PA)	PA 5	Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.					
Aims	РА 6	Work effectively within multi-disciplinary teams.					
ogram	PA 7	Communicate effectively.					
Pre	PA 8	Consider the impacts of engineering solutions on society & environment.					
	PA 9	Demonstrate knowledge of contemporary					
	PA 10	Display professional and ethical responsibilities; and contextual understanding					
	PA 11	Engage in self- and life- long learning.					
	PA 12	Work with mechanical design and manufacturing systems.					
	PA 13	Use of mathematics and physical and engineering sciences and systems analysis					



	tools in products, components and machines design, and/or the manufacturing of such products, components and machines.			
PA 14	Use different instruments, devices and tools appropriately and carry-out wide range of experiments, automatic data acquisition, data analysis and interpretation, and data presentation, both orally and in the written form.			
PA 15	Use the computer software for design, communication and visualization.			
PA 16	Use and/or develop computer software, necessary for the design, manufacturing and management of industrial systems and projects.			
PA 17	Analyze multi-disciplinary mechanical, electrical, electronic, thermal and hydraulic systems.			
PA 18	Lead and supervise groups of designers, technicians and other work force.			

Table [2] The relationship matrix of "Program's Mission Vs Graduate's attributes"

			Graduate Attribu	utes (GA)	
_		GA1	GA2	GA3	GA4
sior	PM1				
Mis	PM2				
E	PM3				
ogra	PM4				
Ъ́г	PM5				



Table [3] The relationship matrix of "Program Aims Vs Program Graduate's Attributes".

	0	att	Gradu ribut	uate's es (G	s iA)
		GA 1	GA 2	GA 3	GA 4
	PA 1				
	PA 2				
	PA 3				
	PA 4				
	PA 5				
	PA 6				
A)	PA 7				
IS (F	PA 8				
Aim	PA 9				
am	PA 10				
ogr	PA 11				
Ъ	PA 12				
	PA 13				
	PA 14				
	PA 15				
	PA 16				
	PA 17				
	PA 18				



Table [4] The relationship matrix of "Graduate's Attributes Vs Program's Competences ".

		att	Gradı ribut	uate's es (G	s iA)
		GA 1	GA 2	GA 3	GA 4
	A 1				
	A 2				
	A 3				
	A 4				
	A 5				
	A 6				
	Α7				
	A 8				
(A	A 9				
IS (F	A 10				
Ain	B1m				
am	B2m				
ogr	B3m				
Pr	B4m				
	C1				
	C2				
	C3				
	C4				
	C5a				
	C5b				
	C5c				
	C5d				



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Courses	AO	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2	C	C4	C5a	C5b	CSc	C5d
									U	nivers	ity Re	equire	emen	ts									
ASU 011	•																						
ASU 111	•																						
ASU 112	•								•	•													
ASU 113									•	•													
ASU 114						•			•														
ASU 321		•	•																				
ASU 322									•														
ASU 323					•						•												
ASU 324										•													
ASU 331								•															
ASU 332								•															
ASU 333							•			•	•												
ASU 334				•			•																
ASU 335						•			•		•												
ASU 336				•																			
									F	aculty	/ Req	uirem	ents										
РНМ 011	•																						
ENG 111				•	•																		
РНМ 012		•	•																				
РНМ 013		•	•																				
РНМ 021		•	•						•														
РНМ 022		•							•														
РНМ 031																							
РНМ 032		•	•						•														
РНМ 041																							
РНМ 111																							

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Ain Shams University, Faculty of Engineering Design and Production Engineering Program Program Specifications, 2018/2019



MDP 081																					
MDP 011			•					•													
CEPOI								•	•												
SE0(31						•															
ENG (011	•			•	•		•	•													
		1	1	1	1	1	Mec	hanic	al Eng	ginee	ring R	equir	eme	nts			1				
чНМ 112																					
НМ F 131											•										
ЛЕР Р 111												•	•								
160 NEP N													•	•							
ЛЕР N 212 2											•										
AEP N												•	•								
16P N													•	•							
1DP N											•										
1DP N													•								
1DP N 11 1											•			•							
1DP N													•								
11 2													•								
IDP N 52 3													-	•							
DP V 51 1													•	-							
DP M 81 2													•								
CT M 11 1													•								
11 2																					
2M M 16 3													-								
E2 EF												-									
DP EC 31 1													-								
Σŵ						Desir					ginge	rin - F			nto				-		
ЪР 1						Desig	sn an				ginee		equi								
Р МГ 33																			•	 	
MDI 312																	•				
MDP 381															•	•		•	•		

Ain Shams University, Faculty of Engineering Design and Production Engineering Program Program Specifications, 2018/2019



MDP 382											•					
MDP 383											•					
MDP 384																
MDP 481											•	•				
MDP 482									•							
MDP 483										•						
MDP 332											\bullet					
MDP 333												•				
MDP 431											•					
MDP 432												•				
MDP 433									•		•	•	•			
MDP 401													•	•	•	•
MDP 402													•	•	•	•
MDP 411/2/ 3/4/5	•												•			
MDP 434/5/ 6/7														•		
MDP256 MDP451/ 2/3/4/5															•	
MDP 84/5/6/ 7/8/9																



Table [6] Program courses classification according to subject areas

	Code	Course Title	Credit Hours	Humanities and Socia Sciences (Univ. Req.)	Business Administration	Mathematics and basic sciences	Engineering Knowledge	Basic Engineering Sciences	Engineering Applications and	Project and Field Training
		UNIVERSITY REQ.								
1.	ASU011	Technical English Language								
2.	ASU111	Human Rights	2	2						
3.	ASU112	Report Writing and Communication skills	3	3						
4.	ASU113	Professional Ethics and Legislations	3	3						
5.	ASU114	Selected Topics in Contemporary Issues	2	2						
6.		ASU Elective (1)	2	2					<u> </u>	
7.		ASU Elective (2)	2	2						
	(LEVEL A)	FACULTY REQ.								
8.	PHM011	Basic Mathematics								
9.	ENG111	Field Training								
10.	PHM012	Mathematics (1)	3			3				
11.	PHM013	Mathematics (2)	3			3				
12.	PHM021	Vibration and Waves	3			3				
13.	PHIM022	Electricity and Magnetism	3			3				
14.	PHIM031	Statics	3			3				
15.	PHIM032	Dynamics	3			3				
10.		Engineering Chemistry Probability and Statistics	3 2			3 2				
17.		Production Engineering	2	-		2		2		
10.		Engineering Drawing	3					2		
20		Projection and Engineering Graphics	3					3		
20.	CSE031	Computing in Engineering	2				2			
21.	ENG011	Fundamentals of Engineering	2				2			
22.	(LEVEL B)	DISCIPLINE SPECIALITY REO.	2				_			
23.	PHM112	Differential Equations and Numerical Analysis	4			1		1	2	
24.	PHM131	Rigid body dynamics	2			1.5		0.5	_	
25.	MEP111	Thermal Physics	2					2		
26.	MEP211	Thermodynamics	4			2		1	1	
27.	MEP212	Heat Transfer	4			2		1	1	
28.	MEP221	Fluid Mechanics and Turbomachinery	4			1			3	
29.	MEP231	Measurement and Instrumentation	2					2		
30.	MDP111	Mechanical Engineering Drawing	3						3	
31.	MDP112	Machine Construction	3						3	
32.	MDP211	Machine Elements Design	4					2	2	
33.	MDP212	Mechanics of Machines	4					4		
34.	MDP311	Mechanical Vibrations	4					2	2	
35.	MDP152	Metallurgy and Material Testing	3					0.5	2	0.5
36.	MDP251	Casting and Welding Technology	3	1				2		
37.	MDP181	Manufacturing Technology (1)	3					1	1	1
38.	MCT211	Automatic Control	3			2		1		
39.	MCT311	Hydraulics and Pneumatics Control	3			0.5		0.5	2	
40.	EPM116	Electrical Circuits and Machines	4					2	2	



	Code	Course Title	Credit Hours	Humanities and Socia Sciences (Univ. Req.)	Business Administration	Mathematics and basic sciences	Engineering Knowledge	Basic Engineering Sciences	Engineering Applications and	Project and Field Training
41.	ECE215	Introduction to Electronics	2					1.5	0.5	
42.	MDP151	Structures and Properties of Materials	2					2		
43.	MDP231	Engineering Economy	2		2					
44.	MDP232	Industrial Project Management	2		2					
	(LEVEL C)	DISCIPLINE SUB SPECIALIY REQ.								
45.	MDP331	Maintenance Planning	3					3		
46.	MDP312	Mechanical System Design	3						3	
47.	MDP381	Theory of Metal Forming	3			1		1	1	
48.	MDP382	Theory of Metal Cutting	3			1		1	1	
49.	MDP383	Metal Forming Technology, Machines and Dies	3				1		2	
50.	MDP384	Metal Cutting Machines and Technology	3				1		2	
51.	MDP481	Design of Tools and Production Facilities	3				1		2	
52.	MDP482	Metrology and Measuring Instruments	4			2		2		
53.	MDP483	Computerized Numerical Control Machines	2						2	
54.	MDP332	Work Study	3	1				2		
55.	MDP333	Operations Research	3		1	1		1		
56.	MDP431	Operations Management	3		1			1	1	
57.	MDP432	Facilities Planning	3		1			1	1	
58.	MDP433	Quality Control	3			1	1	1		
59.	MDP401	Design and Production Engineering Graduation Project (1)	3							3
60.	MDP402	Design and Production Engineering Graduation Project (2)	3							3
		Concertation Courses								
	MDPxxx	Concentration Elective 1	3						3	
	MDPxxx	Concentration Elective 2	3						3	
		Total	171	16	7	39	8	48	45.5	7.5
		%		8.8	2.4	19.7	4.7	29.7	29.1	5.6



Appendix #2

Ain Shams University – Faculty of Engineering 2018 Bylaws (Articles 9-34)

Part B: Admission Regulations

Article (1): Enrolment Requirements and Scholarship System

- The Faculty of Engineering, Ain Shams University is a Public University. It offers Higher Education in Specialized Programs for Free (Scholarship from the Government) based on the Egyptian Constitution. The students who benefit from this Free Education are those who have completed The Egyptian High School Diploma (Thanaweya Amma) or equivalent, and enrolled to the Faculty of Engineering through the National Coordination Office in the same year of achieving this Diploma or equivalent. The student keeps his Free Education as long as he fulfils the conditions mandated by the Egyptian Laws for Universities and these Bylaws.
- All Programs in these Bylaws are offered with the Credit-Hour System.
- Programs in these Bylaws are divided into two categories: Specialized and Inter-Disciplinary. The Free Education students are allowed to be enrolled in the Specialized Programs, whereas the Inter-Disciplinary Programs (previously known as New Programs) have separate Tuition Fees decided by the Faculty Council every year.
- Students who are not enrolled directly to the Faculty of Engineering, Ain Shams University, through the National Coordination Office, but has achieved the minimum Engineering Sector requirement, can join the Inter-Disciplinary Programs paying the separate Tuition Fees decided by the Faculty Council every year.
- Students who are enrolled directly to the Faculty of Engineering, Ain Shams University, through the National Coordination Office, can join the Inter-Disciplinary Programs paying the separate Tuition Fees.
- The Council of the Faculty of Engineering, Ain Shams University can award extra scholarships for students who have achieved a minimum GPA, or students with limited financial abilities, according to the rules announced by the Council every year.
- The top Thirty students in the Egyptian High School Diploma (Thanaweya Amma Mathematics Section), are fully exempted from paying any tuition fees if they join the Inter-Disciplinary Programs students. To maintain this exemption in the following semesters, the student should maintain a minimum GPA of 3.3 in every semester, otherwise the student will lose this privilege and the other rules will apply.
- If the Free Education student fails to achieve a minimum Semester GPA of 2.0 for 4 consecutive main semesters, he can be exceptionally allowed to register courses for 2 more semesters paying the separate Tuition Fees decided by the Faculty Council at the year of registering the course.
- If a student enrolled in any of the Specialized Programs fails a course two times, he is allowed to register this course again for 4 more times paying the separate Tuition Fees decided by the Faculty Council every year at the year of registering the course.
- Free Education students are allowed to register in the required courses to achieve the degree awarding requirements for his program. Any registered Credit Hours beyond the Program required Credit Hours for any reason is charged the separate Tuition Fees decided by the Faculty Council every year at the year of registering the course.



- Free Education students can only register courses in the main semesters. However, they can register courses in the summer semester paying the separate Tuition Fees decided by the Faculty Council every year at the year of registering the course.
- Free Education students have to register a minimum of 12 Credit hours every main semester.
- Any student not enrolled to the Faculty of Engineering, Ain Shams University can register any number of courses paying the separate Tuition Fees decided by the Council of Ain Shams University every year at the year of registering the course. This student is given a Transcript of the courses he has registered in, showing his grades. By any means, he is not awarded a Bachelor Degree from the Faculty of Engineering, Ain Shams University.

Article (2): Placement Tests to newly admitted students.

The study at the Faculty of Engineering requires minimum level of English Language and Mathematics. The Faculty Council can organize a placement test for the students enrolled to the Faculty in English and Mathematics. The Faculty Council can ask the students who fail these tests to take zero credit courses in order to have equal opportunity with other students.

A placement test in Mathematics will be organized for all accepted students except students with an Egyptian High School Diploma (Thanaweya Amma), IGCSE Certificate, STEM Schools or Nile Schools. A placement test in English will be organized for all accepted students except students with an Egyptian High School Diploma (Thanaweya Amma), IGCSE Certificate, American Diploma, STEM Schools or Nile Schools. The Education and Student Affairs Committee can study any changes in these rules according to the study needs.

Article (3): Tuition Fees for Inter-Disciplinary Programs

- Tuition fees, set per Credit Hour, are specified yearly by the Faculty Council based on the announced Inflation rate. The Faculty Council has to announce these fees before the start of the Academic year.
- The tuition fees are paid every semester (the first and second main semesters) based on the number of credit hours registered by the student, with a minimum of the correspondence of educational service fees of 12 CH each semester, unless the number of credit hours remaining for the fulfilment of the degree is less than that, in which case the student should pay the actual number of registered credit hours.
- The student pays a fee equivalent to 1 CH every main semester for the extracurricular activities inside the campus.
- The educational service fees for the Summer semester are determined based on the actual number of credit hours registered by the student.
- Course Registration is not final until the student pays the educational service fees for the semester.

Article (4): Enrolment to Programs

- The Council of the Faculty of Engineering establishes general rules for admission to the programs considering the student preferences and the principle of equal opportunities as the basis for the admission of students to these programs, taking into consideration the available capacity.
- Free Education students who are enrolled in the Specialized Programs can join the Inter-Disciplinary Programs provided that they achieve a minimum GPA of 3.85 without paying the extra fees associated with the Inter-Disciplinary Programs. They can keep this scholarship as long as they maintain the minimum GPA of 3.85.



- Students enrolled in the Inter-Disciplinary Programs can join the Specialized Programs provided that they achieve a minimum GPA of 3.7. The Programs Administration Board can lower this limit based on the available capacity of the Specialized Programs.
- Students enrolled to the Inter-Disciplinary Programs enjoy the following advantages:
 - Can transfer to the Faculty of Engineering, Ain Shams University if his High School Grade qualifies him to join any Faculty of Engineering at a Public University regardless of the rules of the Geographical Region Distribution.
 - Access to new and modern Programs which are needed nowadays in the job market.
 - Program Selection on Admission to the Faculty.
 - Possibility to join the Specialized Programs of their choice according to the rules set yearly by the Council of the Faculty of Engineering.
 - Guaranteed a maximum number of 80 students in the lecture rooms and 40 students in the tutorial classes.
 - Possibility to register courses in the summer semester.

Article (5): Student Transfers from other Universities

Students enrolled in a Faculty of Engineering at another Public university are allowed to be transferred to the Faculty of Engineering, Ain Shams University, if they fulfil the following conditions:

- The student must be transferring to Level 1 only from another equivalent level. It is not allowed to transfer students from higher levels to Level 1.
- The student must have a minimum GPA of 2.3 in the Freshman Year if he is transferred from a Credit-Hour System or a minimum Grade of "Good" if he is transferred from a Semester-Based System.
- It is not allowed to transfer students who are dismissed from their Faculty because of exceeding the maximum number of academic probation or failures.
- Transfer requests are processed at Ain Shams University Administration.

The Education and Student Affairs Committee can study any changes in these rules according to the study needs.

Transfers to Specialized Programs:

- Student transferred to Specialized Programs must be registered in the mainstream system in his home university.
- The student must have been awarded the Egyptian High School Diploma (Thanaweya Amma) from a school within the Geographical Area of Ain Shams University.
- The student place of accommodation lies within the Geographical Area of Ain Shams University. This has to be recorded in the student National ID and it has to be more than 12 months old.
- The student is not allowed to change his place of accommodation to another address outside the Geographical Area of Ain Shams University as long as he is a student enrolled at the Faculty of Engineering, Ain Shams University.
- It is not allowed to transfer students from another University in Greater Cairo (Cairo, Shoubra, Helwan, Matareya).
- The student is not allowed to use the University Accommodation City as long as he is a student enrolled at the Faculty of Engineering, Ain Shams University.
- Maximum number of transferred students to Level 1 is not more than 5% of the total number of students in the same level at the Faculty of Engineering, Ain Shams University.



- The applying students are ranked in a descending order based on their grades in the Freshman year or marks in the preparatory year. If two students are equal, then the High School Diploma mark is considered.
- To join a certain program, the student grade must be more than the minimum grade of this program for the Faculty of Engineering, Ain Shams University students.
- The students are distributed among different programs based on a special coordination provided that the maximum number of transferred students is not than 5% of the total number of students in the same level in this program.
- The student maintains his scholarship of 136 CH.

Transfers to Inter-Disciplinary Programs:

- It is possible to transfer students from any Faculty of Engineering at a public university to the Inter-Disciplinary Programs and pay the applicable Fees.
- It is possible to transfer students from higher levels to Level 1, but with a maximum of 68 CH or their equivalence from the Semester-Based System.
- The student pays equivalence fees of Two Credit Hours as administration fees to process the equivalence request.

Transfers from the Military Technical College:

- The student must have resigned or dismissed for medical reasons only.
- To transfer to Freshman Year, the student must have achieved the National Coordination Office minimum limit for the Faculty of Engineering, Ain Shams University to join the Specialized Programs, and minimum limit of Public Faculty of Engineering to join the Inter-Disciplinary Programs on the same year that he has obtained the Egyptian High School Diploma (Thanaweya Amma).
- To transfer to a higher level, an equivalence is performed for his courses.

Transfers from Non-Engineering Faculties:

• The student must have achieved the National Coordination Office minimum limit for the Faculty of Engineering, Ain Shams University to join the Specialized Programs, and the minimum limit of Public Faculty of Engineering to join the Inter-Disciplinary Programs on the same year that he has obtained the Egyptian High School Diploma (Thanaweya Amma).



Part C: Study Regulations based on Credit Hour System

The articles in this Part regulates the course teaching, learning and assessment throughout the programs. These articles are based on the 2014 Terms of Reference for the design of Credit-Hour Programs for undergraduate level published by the Engineering Sector Committee, Supreme Council of Universities on 3rd of May 2014.

Article (6): Programs' System

- The official teaching Language is English, and the Faculty of Engineering will ascertain the student's English Language proficiency. Textbooks, assignments, and examinations are all in English.
- The Programs follow the Credit-Hour (CH) system. This is a measure of the contact hours between the teachers and the student per semester. One Credit Hour is equivalent to the course Contact Hours as follows:
 - One Hour weekly lecture for a semester of 15 weeks.
 - Two Hours weekly tutorial for a semester of 15 weeks.
 - \circ $\;$ Three Hours weekly Laboratory work for a semester of 15 weeks.
- One Contact Hour is divided into 50 minutes actual teaching and 10 minutes break.
- For each course and Program in this curriculum, the European Credit Transfer and Accumulation System (ECTS) is given as a numerical descriptive value of qualification expressed in terms of Student Work Load (SWL). It is defined as "the number of working hours typically required to complete the learning activities of course units in order to achieve their expected learning outcomes". This system was adopted through the Bologna declaration in 1999 at the University of Bologna in Italy to facilitate the mobility of students through Europe.
- The total SWL comprises two components:
 - \circ The structured SWL which is the scheduled teacher-contact hours interventions.
 - The unstructured SWL (USWL) which is the time spent by students in their own self-study, completing course assignments, and preparing for all types of exams, e.g. assessment workload.
- It has been considered as an essential description of the educational qualification recommended in the European Higher Education Area as a key element of the Bologna and Europeans Framework Qualifications in terms of total SWL.
- One ECTS credit corresponds to 25 hours of total student working, and each 15-weeks academic semester should meet 30 ECTS. As an agreed requirement, 750 hours of total SWL are necessary in a full academic semester, or about 50 hours of total SWL/per week.
- Expected values for each semester:
 - o 16-19 CH
 - 25-28 Contact hours per week for 15 weeks
 - 750 hours of total student work load
 - 30 ECTS

The distribution of marks is left to course designer to decide. It depends on the nature of the course. Some courses are theoretical, and therefore give more marks to the exams, and some courses are more practical and therefore give more marks to the projects, assignments and labs.



Article (7): Study Levels

Whenever the student completes 20% of the Program requirements (34 Credit Hours), he will be transferred from one level to the next (Level 0 to Level 4). The following Table shows the student status based on the completed number of achieved Credit Hours.

Study Level	Student Status	Achieved Credit Hours
0	Freshman	0 CH to less than 34 CH
1	Sophomore	35 CH to less than 68 CH
2	Junior	69 CH to less than 102 CH
3	Senior-1	103 CH to less than 136 CH
4	Senior-2	137 CH to less than 170 CH

Table 1 Study Levels and relation to the achieved Credit Hours.

Article (8): Academic Semesters and Course Registration

- The academic year comprises two main semesters, and one summer semester:
 - First main semester (Fall): Begins on Saturday of the third week of September and lasts for 15 weeks of teaching followed by 3 weeks of examinations. Course registration takes place within 3 weeks before the starting day of the semester.
 - Second main semester (Spring): Begins in February and lasts for 15 weeks followed by 3 weeks of examination. Course registration takes place within 1 week before the starting day of the semester.
 - Summer semester: Begins late June or early July and lasts for 7 weeks followed by 1 week of examination. Course registration takes place within 1 week before the starting day of the semester.



Figure 1 Academic Calendar.

• Registration is not final until the full tuition fees of the semester are paid.



- New students' enrolment in the programs takes place all year long, after fulfilling all the programs requirements and paying the enrolment fees, per the student status.
- Registration in the Summer semester is optional.

Article (9): Program Study Duration

- The minimum allowed study duration is nine main semesters.
- The maximum allowed study duration is twenty main semesters (ten years), which does not include frozen semesters for reasons accepted by the Faculty of Engineering Council, after which the student is dismissed from the programs.

Article (10): Terms of Course Registration

- The student may register courses in the main semesters with a maximum total Credit Hours according to the following rules (after approval of the Academic Advisor):
 - Up to 21 Credit Hours or 7 courses, whichever is greater for a student with a Cumulative GPA larger than or equal to 3.0
 - Up to 18 Credit Hours or 6 courses, whichever is greater for a student with a Cumulative GPA larger than or equal to 2.0, but less than 3.0
 - Up to 14 Credit Hours or 5 courses, whichever is greater for a student with a Cumulative GPA less than 2.0
- The student may register courses in the Summer semester in a maximum total Credit Hours according to the following rules (after approval of the Academic Advisor):
 - Up to 9 Credit Hours or 3 courses, whichever is greater for a student with a Cumulative GPA larger than or equal to 3.0
 - Up to 8 Credit Hours or 2 courses, whichever is greater for a student with a Cumulative GPA less than 3.0
- The student may register one additional course to the above limits if this will lead to his graduation after the approval of the academic advisor, if this course is offered in his program. For Inter-Disciplinary Programs, the course will be offered even if it is not normally offered in this academic semester.
- Late registration is not final unless there is a vacancy in the course, and the student should pay additional administrative fees equal to 1 Credit Hour, if applicable, in accordance with the recommendations of the Education and Students Affairs Committee and approval of the Council of the Faculty of Engineering regarding this issue.
- It is allowed that Non-Degree students can register courses provided that they pay the applicable regular tuition fees related to these courses. The student will be given a transcript of the courses he has joined, showing his grades as per these regulations.
- Degree and Non-Degree students can register courses as audit in some courses provided that there is a vacancy in these courses, and after paying the applicable academic service fee, which is three fourth of the course regular tuition fees. Audit students are not eligible to enter the course final exam.



Article (11): Degree Awarding Requirements

- To obtain the Bachelor of Science Degree in Engineering, the student must successfully complete the required Credit Hours in one of the programs according to the requirements stipulated in Part D, with a GPA at graduation of at least 2.0.
- The student must pass all zero-credit courses in his Program.
- A graduation project is an essential part of all the programs requirements for graduation. The graduation project may be completed over two successive semesters, as per the program requirement, and the student will not graduate unless he fulfils the project pass requirements. The student must earn at least 130 Credit Hours to register for the graduation project. If the project is divided along two semesters, the student must register them in their order.
- The student must perform Field Training for 12 weeks during his study duration.
- The student can study a number of courses in another University which has a cooperation agreement with Ain Shams University regarding the transfer of Credits. This requires prior approval from the Faculty of Engineering, Ain Shams University. The Credit Hours of these courses are included in the student's graduation requirements, provided that the total Credit Hours of these courses do not exceed 68 Credit Hours.

Article (12): Field Training

- The student must perform Field Training for 12 weeks in an industrial or service facility related to the student's program and must be under the full supervision of the faculty. It is also possible to perform the training inside the faculty in a similar environment.
- The training follow-up will be handled by the academic advisor assigned by the Program Steering Committee.
- Identifying a company official contact person.
- The student must submit a technical report to his academic advisor at the end of the training period.
- The company should submit a student's training evaluation form to the academic advisor at the end of the training period.
- The training is divided into periods of 4 weeks at the end of the first, second, and third levels. (Can be in the fourth level as well open during the semester)
- Training for a period 6 weeks is allowed for only one time during the study duration.
- The field training is evaluated on pass / fail basis and does not count in the cumulative GPA calculation.
- The student should pay the supervision fees for the field training at a rate of 2 Credit Hours, if applicable, each academic year during which he is performing Field Training.

Article (13): Adding and Dropping a course

- The student may add courses in the first week of the main semesters, or the first three days of the summer semester.
- The student can drop courses with refundable fees, if applicable, until the end of the second week of the main semesters or the end of the first week of the summer semester.
- Adding or Dropping course(s) should not violate the minimum and maximum number of Credit Hours registered per semester.



Article (14): Withdrawal from a course

- The student may withdraw from any course within the first ten weeks of the main semesters or the first five weeks for the Summer semester.
- The student does not fail the withdrawn course, provided that the withdrawal application and approval are finalized within the time limit mentioned in the previous point.
- The student gets a (W) grade for the withdrawn course and is allowed to register that course (full attendance and performing all activities including examinations) in a following semester.
- For elective courses, the student is allowed to change it in a following semester if he fails to pass it or withdraws from it. This is subject to the approval of the academic advisor and the requirements of his program.
- For non-scholarship students, the tuition fees for this course will not be refunded for withdrawn courses. The next time the student registers this course, he will have to pay its fees in full. The student, who withdraws from a whole semester without registering any course must pay the minimum tuition fees which is equivalent to 12 CH.
- For scholarship students, the Credit Hours of the withdrawn course are deducted from his scholarship. The student will be allowed to register this course one more time for free.

Article (15): Incomplete course

- If a student does not attend the final exam of the course in a semester with an excuse that is accepted by the Student Affairs Committee and approved by the Council of the Faculty of Engineering, the course is considered Incomplete.
- The student will get a grade (I) in the course until the exam is carried out in that course. If the student fails to attend the final exam at the next available date, the student will get a grade (F) in that course. Grade (I) will not count in the student's cumulative GPA.
- At the next available examination date, the student takes the exam, after paying a re-examination fees equivalent to one Credit Hour, if applicable. The marks of this final exam are added to the semester-work marks to calculate the overall grade of this course.

Article (16): Student Evaluation

- The marks of each course are distributed as percentages of the total mark, divided into Course Activities, Mid-Term Exam, Practical Exam, and Final Exam.
- The student must attend at least 75% of all course contact hours to be allowed to attend the course final examination.
- For the student to pass a course, the minimum mark that must be earned in the final exam is 30% of the total exam marks, otherwise the student will fail the course irrespective of the total marks he earned in the course and he will get an F grade in this course. This clause does not apply to the courses with no final exam.
- The student fails the course if he obtains an F grade (less than 60% of the course marks) or was not allowed to attend the final examination because of exceeding the absence percentage or cheating ... etc. or did not attend the final examination without submitting a prior excuse that is accepted by the Education and Student Affairs Committee and approved by the Council of the Faculty of Engineering.
- Zero-Credit courses are marked as Pass or Fail. The student gets a grade but does not contribute to the cumulative GPA. To pass the course, the student should get at least 60% of the course total marks.



Article (17): Course Grades

The GPA of each course is calculated based on the marks a student collects during his study of this course (Student Activities – Mid Term Exam – Practical Exam – Final Exam). The following table shows how to calculate the GPA based on the collected marks. The student must get a minimum Grade D in order to pass the course and be considered in the calculation of the Cumulative GPA.

Marks % Collected	Grade	Points
More than 97%	A+	4.0
93% to less than 97%	А	
89% to less than 93%	A-	3.7
84% to less than 89%	B+	3.3
80% to less than 84%	В	3.0
76% to less than 80%	В-	2.7
73% to less than 76%	C+	2.3
70% to less than 73%	С	2.0
67% to less than 70%	C-	1.7
64% to less than 67%	D+	1.3
60% to less than 64%	D	1.0
Less than 60%	F	0.0

Table 2 Course grades and equivalent GPA.

For other courses where the student is registered as a listener (audit), or is only required to pass (zero credit courses), are not included in the cumulative GPA, the course grades will be as follows:

Grade	Explanation	
AU	Listener (Audit)	
Р	Pass	
F	Fail	
W	Withdrawn	
I	Incomplete	

Table 3 Grades of zero credit courses.

Article (18): Course Repeating

- The student can repeat a course for improvement if his grade satisfies the minimum passing requirement, according to the following rules:
 - The student gets the higher grade of the course after repeating. This grade is the one that will be accounted for in the cumulative GPA, on condition that the improvement should be shown in the student's transcript.
 - The maximum number of times that the student can repeat for repeating is five times during his study duration, except for improving courses with the purpose of getting out of the academic probation or satisfying the graduation requirements.
 - The student should pay the full credit hours fees for the improving course.



- If the student fails a course (gets F grade), he should repeat the course (full attendance and performing all activities including examinations), according to the following rules:
 - The maximum grade of the repeated course is B+.
 - The student gets the grade of the course after repeating. This grade is the one that will be accounted for in the cumulative GPA, on condition that the repeating should be shown in the student's transcript.
 - \circ $\;$ The student should pay the full credit hours fees for the repeated course.
- If a student repeats a course, he is required to repeat all course assessment criteria and will be completely re-evaluated. The course grade is calculated from scratch.

Article (19): Study Dismissal and Academic Probation

- A student gets an academic probation if his GPA at any main semester is less than 2.0.
- A student will be dismissed from the Faculty of Engineering, Ain Shams University if he gets GPA less than 2.0 in six consecutive semesters excluding Summer Semesters. If the student's GPA exceeds 2.0 in any semester including summer semester, then the number of consecutive academic probation is reset.
- The student will be dismissed from the Faculty of Engineering, Ain Shams University if he fails to achieve the graduation requirements during the maximum study duration, which is ten years.
- The student who is exposed to study dismissal due to his inability to raise his GPA to at least 2.0 will be offered an additional and final chance to register in 2 consecutive main semesters and a summer semester to raise his GPA to at least 2.0 and achieves the graduation requirements, provided that he has successfully completed at least 80% of the total number of credit hours required for graduation and there is a chance for the student to raise his GPA to at least 2.0.

Article (20): Calculation of the Cumulative Grade Point Average (GPA)

- Course points achieved by the student are calculated as the number of Credit Hours of this course multiplied by the course grade points according to Table 2.
- In any semester, the total points earned by the student are calculated as equal to the sum of the courses points the student earned in this semester.
- The Cumulative GPA at the end of any semester is calculated as the total points achieved by the student in all courses studied divided by the total number of Credit Hours of these courses, taking into consideration the rules relevant to the repeated and improved courses.

$$Cumulative GPA = \frac{\sum_{Courses} Grade Points * Credit Hours}{\sum_{Courses} Credit Hours}$$

- The Semester GPA is calculated as the total points achieved by the student in his courses of this semester divided by the total number of Credit Hours of these courses.
- The Graduation Cumulative GPA is the Cumulative GPA at Graduation, after fulfilling all the graduation requirements. The student cannot get the degree unless he achieves at least a cumulative GPA of 2.0.
- The ranking of the graduate is determined based on the Graduation Cumulative GPA. In case of equal Graduation Cumulative GPA between two or more students, the ranking will be based on their total accumulative marks, taking into consideration the rules relevant to the repeated and improved courses.



• The student's Transcript should include all registered courses during the study duration, including these he failed, withdrew from, or improved.

Article (21): Declaration of Honour

- For a student to achieve the declaration of homer, he has to fulfil the following conditions:
 - Maintain a cumulative GPA of 3.3 throughout his study at the Program.
 - \circ $\;$ Does not fail any course throughout his study at the Program.
 - Did not get any penalty throughout his study at the Faculty

Article (22): Minimum Number of Students for Course Opening

- The minimum number of students required to open a course is 10 students, or 75% of the number of students registered in this program level, whichever is less.
- The minimum number of students required to open an elective course is 5 students or 25% of the number of students in this program level, whichever is less.
- Course opening is subject to the availability of teaching staff and the proper allocation of facilities.
- The Programs Administration Board may provide exceptions to these limits if there is a necessity.

Article (23): Academic Advisor

- Every student is assigned an Academic Advisor who follows-up the student academic progress and assists him in selecting the courses each semester.
- There can be more than one Academic Advisor in the Program based on the number of students enrolled in the Program.
- The Program Academic Advisor is responsible for:
 - Helping the student to choose his academic path and helps him to select courses each semester.
 - Helping the student with the choice of the Field Training.
 - Helping the student with the choice of concentration and graduation project.
- The Academic Advisor may ask the student to repeat courses which he has already passed or ask him to register in additional courses to raise his cumulative GPA to that required for graduation.

Article (24): Appeals

- The student can submit an appeal to review his course marks within a week from grades announcement, and after paying the required fees in accordance with the faculty regulations regarding this issue.
- In case of general complaint from a course result, the concerned committee reviews the students' marks and give a decision regarding the marks of this course.

Article (25): Student Transfer between Credit Hour System and Semester-Based System

• It is possible to transfer students from another Engineering program with semester-based system (either inside or outside the Faculty of Engineering, Ain Shams University) to any of the programs in these regulations, according to the admission regulations in Part B.



- Course equivalence will be performed between the courses already the student passed in the Semester-Based program and the equivalent courses in the programs offered here.
- The following table is used to calculate the equivalent grades when transferring the student from the Semester-Based system to the Credit-Hour system.



From	То	
Semester Based System	Credit-Hour System	
Equivalent Percentage	Points	Grade
More than 95%	4.0	A+
90% to less than 95%	4.0	А
85% to less than 90%	3.7	A-
80% to less than 85%	3.3	B+
75% to less than 80%	3.0	В
71% to less than 75%	2.7	B-
68% to less than 71%	2.3	C+
65% to less than 68%	2.0	С
60% to less than 65%	1.7	C-
55% to less than 60%	1.3	D+
50% to less than 55%	1.0	D
Less than 50%	0.0	F

Table 4 Equivalent grades when moving from Semester Based System to Credit Hour System.

Article (26): General Provisions

- These regulations apply to the newly admitted students to the Faculty of Engineering, Ain Shams University starting Fall 2018 semester.
- Current students at the Faculty of Engineering can join these Programs and an equivalence can be made for the courses they have already passed.
- For any topic not covered by these regulations, the applicable Law of Universities and its amendments are taken as a reference, and if not covered by the Law, then it should be presented to the Programs Administration Board to take the appropriate recommendation(s) for presentation to the Council of the Faculty of Engineering for approval before submission to the University Council.