



Faculty of
Engineering at
benha

Farabi Quality Management of Education and Learning - 23/1/201923/1/2019

Model No.13
Programme Specifications
Production and Design Engineering
Academic Year2017 - 2018

University :Benha university
Faculty :Faculty of Engineering at benha

A- Basic information :

1. Programme title	Production and Design Engineering
2. Programme type	Single
3. Adoption program Date	03/07/2012
4- Department responsible for the program	Department الهندسة الميكانيكية - 1 / Faculty of Engineering at benha

B- Specialized information :

1- General objectives of the program

- 1- The student should be able to acquire knowledge and understanding of key facts, theories, concepts, principles, and techniques relevant to mechanical engineering.
- 2- The student should be able to gain the basic knowledge in different mechanical engineering works especially in the field of mechanical production engineering, material technology, manufacturing technologies, design, operation, optimization and control of a wide range of production engineering systems and equipment's.
- 3- The student should be able to define, analyze and solve mechanical production engineering problems to reach proper conclusions.
- 4- The student should be able to prepare engineering drawings computer graphics and prepare specialized technical reports.
- 5- The student should be able to develop self-learning skills.
- 6- The student should be able to work in a team, communicate with others efficiently, lead, or supervise a group of engineers and deal with others according to the rules of professional ethics.

2- Intended learning outcomes (ILOS)

a- Knowledge and Understanding

- a1- Concepts, principles and theories relevant to mechanical engineering and manufacture
- a2- The constraints within which his/her engineering judgment will have to be exercised
- a3- The specifications, programming and range of application of CAD and CAD/CAM facilities
- a4- Relevant contemporary issues in mechanical engineering
- a5- Basic electrical, control and computer engineering subjects related to the discipline
- a6- The role of information technology in providing support for mechanical engineers
- a7- Engineering design principles and techniques
- a8- Management and business techniques and practices appropriate to engineering industry

b- Intellectual Capacity

- b1- Apply the principles of mathematics, science and technology in problem solving scenarios in mechanical engineering
- b2- Analyze and interpret data, and design experiments to obtain primary data

- b3- Evaluate and appraise designs, processes and products, and propose improvements
- b4- Interpret numerical data and apply analytical methods for engineering design purposes
- b5- Use the principles of engineering science in developing solutions to practical mechanical engineering problems
- b6- Select appropriate manufacturing method considering design requirements

c- Professional Skills

- c1- Prepare engineering drawings, computer graphics and specialized technical reports and communicate accordingly
- c2- Employ the traditional and modern CAD and CAD/CAM facilities in design and production processes
- c3- Use basic workshop equipment safely
- c4- Analyze experimental results and determine their accuracy and validity
- c5- Use laboratory equipment and related computer software
- c6- Operate and maintain mechanical equipment
- c7- Prepare the process plan for manufacturing

d- General Skills

- d1- Communicate effectively

3- Academic standards

- 1- National Academic Reference Standards (NARS).

4- External references for standards (Benchmarks)

- 1- American Accreditation Board for Engineering and Technology (AABET)

5- Curriculum structure and contents

a - Programme duration 5

b - Programme Structure

1 - No of hours /No of Units :	Theoretical	162	Practical	178	Total	340
	Compulsory	318	Elective	22	Optional	0
2 - Basic sciences Courses :	84			24.7%%		
3 - Social sciences and humanities courses :	20			5.9%%		
4 - Specialized courses :	216			63.5%%		
5 - Other Courses :	18			5.3%%		
6 - Practical/field training:	2					

6- Programme courses

-Fourth Year / (اللائحة الداخلية لكلية الهندسة ببنها) الأنتاج والتصميم / الهندسه الميكانيكيه

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
١٤٨١ م	Operations Researches	3	3	2	1	First Semester
١٤٧٣ م	Materials Handling	3	3	2	1	First Semester
١٤٧١ م	Computer Aided Manufacturing CAM	3	3	2	1	First Semester
١٥٠٠ م	Project	2	2		6	First Semester
١٤١٣ م	Hydraulic and Pneumatic Power	3	3	2	1	First Semester

	Systems					
١٤٠١ م	Field Training-Field Training	1	0	0	2	First Semester
١٤٠١ م	Legislation And Contracts	2	2	0	0	First Semester
١٤٦٢ م	Projects Management	3	3	2	1	Second Semester
١٥٠٠ م	Project	2	2		6	Second Semester
١٤٨٢ م	Engineering Economy	2	2		1	Second Semester

b- Optional :

Code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
١٥٨١ م	Quality Control and Assurance	2	2	1	1	First Semester
١٥٧١ م	Product Design and Development	3	3	2	1	First Semester
١٥٨٦ م	Productivity Motion and Time Study	3	3	2	1	Second Semester
١٥٨٢ م	Statistical Quality Control	3	3	2	1	Second Semester
١٥٨٤ م	Advanced Operations Researches	3	3	2	1	Second Semester
١٥٧٢ م	Industrial Automation-Industrial Automation	3	3	2	1	Second Semester
١٥٧٦ م	Machine Tool Design-Machine Tool Design	3	3	2	1	Second Semester
١٥٧٤ م	Design of Jigs and Fixtures-Design of Jigs and Fixtures	3	3	2	1	Second Semester

(اللائحة الداخلية لكلية الهندسة بينها) الإنتاج والتصميم / الهندسة الميكانيكية / -Third Year

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
١٣٢٣ م	Heat Transfer	3	3	2	1	First Semester
١٣٦١ م	Mechanical Design	3	3	2	1	First Semester
١٣٥١ م	System Dynamics and Vibrations	3	3	2	1	First Semester
١٣٣١ م	Environment and Pollution	1	1	1		First Semester
١٣٦٣ م	ComputerAided Design CAD	3	3	2	1	First Semester
١٣٧١ م	Metal Cutting Theory	3	3	2	1	First Semester
١٣٧٢ م	Advanced Machining Processes-Advanced Machining Processes	3	3	2	1	Second Semester
١٣٠٠ م	Technical Report	1	0	0	2	Second Semester
١٣٦٤ م	Design of Experiments	3	3	2	1	Second Semester

١٣٥٢ م	Automatic Control	3	3	2	1	Second Semester
١٣٨٤ م	Production Management	2	2	0	0	Second Semester
١٣٢٤ م	Thermo Fluid Machines	3	3	1	1	Second Semester
١٣٦٢ م	Material Engineering	3	3	1	2	Second Semester

b- Optional :

-Preparatory Year (الانحة الداخلية لكلية الهندسة بينها)

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
١٠٦١ م	Engineering Drawing A-Engineering Drawing A	1			3	First Semester
١٠١١ س	Mathematics 1 A	4	4	2	0	First Semester
١٠٣١ س	Physics A	4	4	-	2	First Semester
١٠٤١ س	Chemistry A	4	4	2	2	First Semester
١٠٢١ ك	Computer Fundamentals and Programming A	1	0	0	2	First Semester
١٠١١ ج	Technical English Language A	1			2	First Semester
١٠٧١ م	Production Engineering and Workshops A-Production Engineering and Workshops A	2	2	0	3	First Semester
١٠٢١ س	Mechanics A	4	4	2		First Semester
١٠٠٢ م	Technology and Society-Technology and Society	2	2			Second Semester
١٠٢٢ س	Mathematics 1 B-Mechanics B	4	4	2		Second Semester
١٠٤٢ س	Chemistry B	4	4	2	2	Second Semester
١٠١٢ س	Mathematics 1 B	4	4	2	0	Second Semester
١٠٢٢ ك	Computer Fundamentals and Programming B	1	0	0	2	Second Semester
١٠١٢ ج	Technical English Language B	1			2	Second Semester
١٠٧٢ م	Production Engineering and Workshops B	2	2	0	3	Second Semester
١٠٣٢ س	Physics B	4	4	0	2	Second Semester
١٠٦٢ م	Engineering Drawing B-Engineering Drawing B	3			3	Second Semester

b- Optional :

(الأئحة الداخلية لكلية الهندسة ببها) الهندسه الميكانيكيه / -First Year

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
ج ١١١١	Language-Language	1			2	First Semster
ك ١١٢٥	Computer Applications A-Computer Applications A	1	0	0	2	First Semster
س ١١١١	Mathematics 2 A	3	3	2	0	First Semster
م ١١٧١	Principles of Manufacturing Workshop A-Principles of Manufacturing Workshop A	2	2	0	3	First Semster
م ١١٥١	Theory of Machines A-Theory of Machines A	3	3	1	1	First Semster
م ١١١١	Fluid Mechanics A	3	3	1	1	First Semster
د ١١٠٧	Civil Engineering Technology	3	3		1	First Semster
م ١١٦١	Mechanics of Materials	3	3	1	1	First Semster
م ١١٦٣	Mechanical Engineering Applications A-Mechanical Engineering Applications A	1			1	First Semster
ج ١١٢٢	Human Rights	2	2	-	-	Second Semster
م ١١٦٤	Mechanical Engineering Applications B-Mechanical Engineering Applications B	2	0	0	3	Second Semster
م ١١٦٢	Materials Technology-Materials Technology	3	3	1	1	Second Semster
س ١١١٢	Mathematics 2 B	3	3	2	0	Second Semster
م ١١٥٢	Theory of Machines B-Theory of Machines B	3	3	1	1	Second Semster
م ١١١٢	Fluid Mechanics B	3	3	1	1	Second Semster
م ١١٧٢	Principles of Manufacturing Workshop B-Principles of Manufacturing Workshop B	3	3	2	1	Second Semster
ك ١١٢٦	Computer Applications B-Computer Applications B	2	0	0	4	Second Semster

b- Optional :

(الإثحة الداخلية لكلية الهندسة ببنها) الهندسة الميكانيكية / -Second Year

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
م ١٢٨٣	Industrial Safety-Industrial Safety	2	2	0	0	First Semster
ك ١٢٠٩	Electrical and Electronic Circuits-Electrical and Electronic Circuits	2	2	1	1	First Semster
س ١٢١٣	Mathematics 3 A-Mathematics 3 A	3	3	2		First Semster
م ١٢٢١	Thermodynamics A-Thermodynamics A	3	3	1	1	First Semster
م ١٢٨١	Mechanical Systems Maintenance A-Mechanical Systems Maintenance A	1			2	First Semster
م ١٢٥١	Measurement Devices-Measurement Devices	3	3	1	2	First Semster
م ١٢٦٣	Computer Aided Drafting A	1	0	0	2	First Semster
م ١٢٦١	Mechanics and Testing of Materials-Mechanics and Testing of Materials	2	2	1	1	First Semster
م ١٢٧١	Manufacturing Technology A-Manufacturing Technology A	2	2	1	1	First Semster
م ١٢٨٤	Psychology in Industry-Psychology in Industry	2	2	0	0	Second Semster
م ١٢٢٢	Thermodynamic B-Thermodynamic B	3	3	1	1	Second Semster
س ١٢١٤	Mathematics 3 B	3	3	2		Second Semster
م ١٢٨٢	Mechanical Systems Maintenance B-Mechanical Systems Maintenance B	2			4	Second Semster
م ١٢٦٤	Computer Aided Drafting B	1	0	0	2	Second Semster
ك ١٢٣٨	Electrical Power and Machines	3	3	2	1	Second Semster
م ١٢٧٢	Manufacturing Technology B-Manufacturing Technology B	2	2	1	1	Second Semster
م ١٢٦٢	Design of Machine Elements-Design of Machine Elements	3	3	0	5	Second Semster

b- Optional :

7- Programme admission requirements

1- The students from the Egyptian secondary education or equivalent certificate with major in Mathematics.

8- Regulations for progression and programme completion

Benha university/Faculty of Engineering at benha/التصميم والإنتاج والميكانيكية/الهندسة الميكانيكية/الانتاج والتصميم/Fourth Year

1- The student is considered successful if he passes the examinations in all courses of his study year.,The student is promoted to the next higher level if he fails in not more than

two subjects of his class or from lower classes.,In addition to (1) and (2), the student who fails in two subjects in humanities and social sciences, whether from his class or from lower classes, is admitted to the transfer to the consecutive higher level. Passing successfully in all courses before obtaining the B. Sc. degree is a prerequisite.,The referred student has to sit the examination in the courses in which he has failed together with the students studying the same courses. The student gets a pass grade when he passes the examination successfully. In case the student was considered absent with acceptable excuse in a course, he gets the actual grade.,The grades of the successful student in a course and in the general grade are evaluated as follows: Distinction: from 85% of the total mark and upwards. Very good: from 75% to less than 85% of the total mark. Good: from 65% to less than 75% of the total mark. Pass: from 50% to less than 65% of the total mark.,The grades of a failing student in a course are evaluated as follows: Weak: from 30% to less than 50% of the total mark Very weak: less than 30% of the total mark.,The B.Sc. general grade for students is based on the cumulative marks obtained during his study form the second to the fourth year. The students are then arranged serially according to their cumulative sum.,The student is awarded an honor degree if his cumulative sum is distinction or very good provided that he gets a grade not less than very good in any class of study from the second to the fifth year. Moreover, he should not have failed in any examination he has sat in any class from the second to the fifth year.

Benha university/Faculty of Engineering at benha/الميكانيكية/الانتاج والتصميم/Third Year

2- The student is considered successful if he passes the examinations in all courses of his study year.,The student is promoted to the next higher level if he fails in not more than two subjects of his class or from lower classes.,In addition to (1) and (2), the student who fails in two subjects in humanities and social sciences, whether from his class or from lower classes, is admitted to the transfer to the consecutive higher level. Passing successfully in all courses before obtaining the B. Sc. degree is a prerequisite.,The referred student has to sit the examination in the courses in which he has failed together with the students studying the same courses. The student gets a pass grade when he passes the examination successfully. In case the student was considered absent with acceptable excuse in a course, he gets the actual grade.,The grades of the successful student in a course and in the general grade are evaluated as follows: Distinction: from 85% of the total mark and upwards. Very good: from 75% to less than 85% of the total mark. Good: from 65% to less than 75% of the total mark. Pass: from 50% to less than 65% of the total mark.,The grades of a failing student in a course are evaluated as follows: Weak: from 30% to less than 50% of the total mark Very weak: less than 30% of the total mark.,The B.Sc. general grade for students is based on the cumulative marks obtained during his study form the second to the fourth year. The students are then arranged serially according to their cumulative sum.,The student is awarded an honor degree if his cumulative sum is distinction or very good provided that he gets a grade not less than very good in any class of study from the second to the fifth year. Moreover, he should not have failed in any examination he has sat in any class from the second to the fifth year.

Benha university/Faculty of Engineering at benha/Preparatory Year

3- The student is considered successful if he passes the examinations in all courses of his study year.,The student is promoted to the next higher level if he fails in not more than two subjects of his class or from lower classes.,In addition to (1) and (2), the student who fails in two subjects in humanities and social sciences, whether from his class or from lower classes, is admitted to the transfer to the consecutive higher level. Passing successfully in all courses before obtaining the B. Sc. degree is a prerequisite.,The referred student has to sit the examination in the courses in which he has failed together

with the students studying the same courses. The student gets a pass grade when he passes the examination successfully. In case the student was considered absent with acceptable excuse in a course, he gets the actual grade.,The grades of the successful student in a course and in the general grade are evaluated as follows: Distinction: from 85% of the total mark and upwards. Very good: from 75% to less than 85% of the total mark. Good: from 65% to less than 75% of the total mark. Pass: from 50% to less than 65% of the total mark.,The grades of a failing student in a course are evaluated as follows: Weak: from 30% to less than 50% of the total mark Very weak: less than 30% of the total mark.,The B.Sc. general grade for students is based on the cumulative marks obtained during his study form the second to the fourth year. The students are then arranged serially according to their cumulative sum.,The student is awarded an honor degree if his cumulative sum is distinction or very good provided that he gets a grade not less than very good in any class of study from the second to the fifth year. Moreover, he should not have failed in any examination he has sat in any class from the second to the fifth year.

Benha university|Faculty of Engineering at benha|الميكانيكية|الهندسة|First Year

4- The student is considered successful if he passes the examinations in all courses of his study year.,The student is promoted to the next higher level if he fails in not more than two subjects of his class or from lower classes.,In addition to (1) and (2), the student who fails in two subjects in humanities and social sciences, whether from his class or from lower classes, is admitted to the transfer to the consecutive higher level. Passing successfully in all courses before obtaining the B. Sc. degree is a prerequisite.,The referred student has to sit the examination in the courses in which he has failed together with the students studying the same courses. The student gets a pass grade when he passes the examination successfully. In case the student was considered absent with acceptable excuse in a course, he gets the actual grade.,The grades of the successful student in a course and in the general grade are evaluated as follows: Distinction: from 85% of the total mark and upwards. Very good: from 75% to less than 85% of the total mark. Good: from 65% to less than 75% of the total mark. Pass: from 50% to less than 65% of the total mark.,The grades of a failing student in a course are evaluated as follows: Weak: from 30% to less than 50% of the total mark Very weak: less than 30% of the total mark.,The B.Sc. general grade for students is based on the cumulative marks obtained during his study form the second to the fourth year. The students are then arranged serially according to their cumulative sum.,The student is awarded an honor degree if his cumulative sum is distinction or very good provided that he gets a grade not less than very good in any class of study from the second to the fifth year. Moreover, he should not have failed in any examination he has sat in any class from the second to the fifth year.

Benha university|Faculty of Engineering at benha|الميكانيكية|الهندسة|Second Year

5- The student is considered successful if he passes the examinations in all courses of his study year.,The student is promoted to the next higher level if he fails in not more than two subjects of his class or from lower classes.,In addition to (1) and (2), the student who fails in two subjects in humanities and social sciences, whether from his class or from lower classes, is admitted to the transfer to the consecutive higher level. Passing successfully in all courses before obtaining the B. Sc. degree is a prerequisite.,The referred student has to sit the examination in the courses in which he has failed together with the students studying the same courses. The student gets a pass grade when he passes the examination successfully. In case the student was considered absent with acceptable excuse in a course, he gets the actual grade.,The grades of the successful student in a course and in the general grade are evaluated as follows: Distinction: from 85% of the

total mark and upwards. Very good: from 75% to less than 85% of the total mark. Good: from 65% to less than 75% of the total mark. Pass: from 50% to less than 65% of the total mark.,The grades of a failing student in a course are evaluated as follows: Weak: from 30% to less than 50% of the total mark Very weak: less than 30% of the total mark.,The B.Sc. general grade for students is based on the cumulative marks obtained during his study form the second to the fourth year. The students are then arranged serially according to their cumulative sum.,The student is awarded an honor degree if his cumulative sum is distinction or very good provided that he gets a grade not less than very good in any class of study from the second to the fifth year. Moreover, he should not have failed in any examination he has sat in any class from the second to the fifth year.

9- Assessment rules enrolled in the program

No	Method	As measured from the intended learning outcomes
1-	Written excersice	Knowledge & understanding skills - Intellectual skills
2-	Practical excersice	Knowledge & understanding skills - Professional skills - General & transferable skills
3-	Quizz	Knowledge & understanding skills - Intellectual skills
4-	Oral exams	Knowledge & understanding skills - Intellectual skills - General & transferable skills
5-	Written exams	Knowledge & understanding skills - Intellectual skills
6-	Discussion	Knowledge & understanding skills - Intellectual skills - Professional skills - General & transferable skills
7-	Presentation	Knowledge & understanding skills - Intellectual skills - Professional skills - General & transferable skills

10- Methods of assessment program

No	Evaluator	Tool	Sample
1-	1- Senior Students	Evaluation sheet	
2-	2- Alumni	Evaluation sheet & Seminars	
3-	3- Stakeholders (Employers)	Evaluation sheet & Seminars	
4-	4- External Evaluator	Evaluation sheet & Seminars	
5-	5- Others		

11- Matrix of knowledge and skills

-Fourth Year / الأئحة الداخلية لكلية الهندسة ببنها) الإنتاج والتصميم / الهندسه الميكانيكيه /

a- Compulsory :

No	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Heat Transfer	a1,a2,a6,a7,P0a1,P0a3,P0a4,P0a10,P0a11	b1,b3,b5,b6,P0b1,P0b2,P0b3,P0b4	c4,P0c1,P0c2,P0c7,P0c12	P0d6,P0d9
2-	Mechanical Design	Course do not need specification			
3-	System Dynamics and Vibrations	a1,P0a1,P0a4,P0a5,P0a12	b5,P0b1,P0b2,P0b3,P0b5,b1,P0b12	c1,c5,P0c1,P0c2,P0c5,P0c6,P0c7	P0d1,P0d2,P0d5,P0d6,P0d7,P0d9
4-	Environment and Pollution	Course do not need specification			
5-	ComputerAided Design CAD	Course do not need specification			
6-	Metal Cutting Theory	a1	b1	c1	d1

7-	Advanced Machining Processes	a1,a4,P0a4,P0a8	b3,b6,P0b9,P0b12	c5,c7,P0c11	P0d1,P0d2,P0d7,P0d9
8-	Technical Report	Course do not need specification			
9-	Design of Experiments	Course do not need specification			
10-	Automatic Control	Course do not need specification			
11-	Production Management	a6,a8,P0a5	b4,b5,P0b11	c7,P0c7	d1,P0d9
12-	Thermo Fluid Machines	a1,a4	b1,b4		d1
13-	Material Engineering	a1,a2,a4	b3,b6	c7,c5	d1

b- Optional :

-Preparatory Year (اللائحة الداخلية لكلية الهندسة بينها)

a- Compulsory :					
No	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Engineering Drawing A	P0a2,P0a4,P0a8,P0a10	P0b4,P0b12	P0c2,P0c3,P0c4,P0c11	P0d1,P0d2,P0d3,P0d7
2-	Mathematics 1 A	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1	P0d7
3-	Physics A	P0a1,P0a3	P0b2	P0c1,P0c5	P0d1,P0d9
4-	Chemistry A	P0a1,P0a3	P0b1,P0b5	P0c1	P0d1,P0d9
5-	Computer Fundamentals and Programming A- Computer Fundamentals and Programming A	P0a1,P0a2,P0a5,P0a8	P0b1,P0b2,P0b3,P0b4,P0b6,P0b7,P0b8,P0b12	P0c1,P0c3,P0c5,P0c11	P0d4,P0d5,P0d6,P0d7,P0d9
6-	Technical English Language A	Course do not need specification			
7-	Production Engineering and Workshops A	P0a3,P0a6,P0a4,P0a5	P0b2,P0b5	P0c2,P0c8,P0c10	P0d1,P0d3,P0d5
8-	Mechanics A	P0a5,P0a1	P0b2,P0b3,P0b1	P0c1	P0d1
9-	Technology and Society	P0a6,P0a7,P0a9	P0b9,P0b10	P0c10	P0d2
10-	Mathematics 1 B	P0a5,P0a1	P0b2,P0b3,P0b1	P0c1	P0d1
11-	Chemistry B	P0a1,P0a3	P0b1,P0b2,P0b4	P0c1,P0c5,P0c8	P0d1
12-	Mathematics 1 B	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1	P0d7
13-	Computer Fundamentals and Programming B	P0a1,P0a2,P0a5,P0a8,P0a10	P0b1,P0b2,P0b5,P0b7,P0b8,P0b12	P0c1,P0c3,P0c5,P0c10	P0d1,P0d4,P0d7,P0d9
14-	Technical English Language B	Course do not need specification			
15-	Production Engineering and Workshops B	Course do not need specification			
16-	Physics B	P0a1,P0a3	P0b2	P0c1,P0c5	P0d1,P0d9
17-	Engineering Drawing B	P0a2,P0a4,P0a8,P0a10	P0b4,P0b12	P0c2,P0c3,P0c4,P0c11	P0d1,P0d2,P0d3,P0d6

b- Optional :

(الأئحة الداخلية لكلية الهندسة بينها) الهندسه الميكانيكيه / First Year

a- Compulsory :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Language	P0a10	P0b4	P0c12	P0d1,P0d2,P0d4,P0d5,P0d6,P0d7,P0d9
2-	Computer Applications A	P0a5,P0a8,P0a12	P0b1,P0b3	P0c5,P0c6,P0c1,P0c2	P0d4,P0d6,P0d7
3-	Mathematics 2 A	P0a1,P0a5	P0b1,P0b2,P0b3,P0b7	P0c1	P0d7
4-	Principles of Manufacturing Workshop A	P0a1,P0a3,P0a8,P0a9,P0a10	b5,P0b6	c3,c5	P0d1,P0d5
5-	Theory of Machines A	P0a1,P0a3,P0a4,P0a5	P0b1,P0b2,P0b3	P0c1,P0c2,P0c3	P0d1,P0d2,P0d3
6-	Fluid Mechanics A	P0a1,P0a3,P0a5,P0a8,P0a9,P0a12	P0b1,P0b2,P0b3,P0b4	P0c1,P0c5	P0d2,P0d5,P0d8
7-	Civil Engineering Technology	Course do not need specification			
8-	Mechanics of Materials	P0a1,P0a2,P0a3,P0a4	P0b7,P0b2,P0b3,P0b6	P0c1,P0c4,P0c5	P0d1,P0d6,P0d7,P0d9
9-	Mechanical Engineering Applications A	a2,a4,P0a4,P0a6,P0a8	P0b3,P0b4,P0b9	c1,P0c5,P0c6,P0c12	P0d1,P0d6,P0d9
10-	Human Rights	P0a9	P0b4		
11-	Mechanical Engineering Applications B	a1,a4,P0a4,P0a6,P0a8,P0a10	b5,P0b3,P0b4,P0b9	c1,P0c5,P0c8	P0d1,P0d2,P0d6
12-	Materials Technology	a4	b6	c7	d1
13-	Mathematics 2 B	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1	
14-	Theory of Machines B	P0a1,P0a3,P0a4,P0a5,P0a10	P0b1,P0b2,P0b3,P0b5	P0c1,P0c2,P0c3,P0c10,P0c11	P0d1,P0d2,P0d3,P0d7
15-	Fluid Mechanics B	P0a1,P0a3,P0a5,P0a8	P0b1,P0b2,P0b3,P0b4	P0c1,P0c5	P0d2,P0d5,P0d8
16-	Principles of Manufacturing Workshop B	a1,a2,P0a4,P0a8	P0b6,P0b7,P0b9	c3,P0c6	P0d1,P0d2,P0d6
17-	Computer Applications B	P0a5,P0a8,P0a12	P0b1,P0b3	P0c1,P0c2,P0c5,P0c6	P0d4,P0d6,P0d7

b- Optional :

-Fourth Year / (الإحة الداخلية لكلية الهندسة بينها) الأنتاج والتصميم / الهندسه الميكانيكيه

a- Compulsory :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Operations Researches	a2,a8,a1,a4	b4,b5,b3	c4	d1
2-	Materials Handling	a2,a1,a4,a8	b1,b4,b5	c1,c6	d1
3-	Computer Aided Manufacturing CAM	Course do not need specification			
4-	Project	Course do not need specification			
5-	Hydraulic and Pneumatic Power Systems	Course do not need specification			
6-	Field Training	P0a6,P0a7,P0a8,P0a9,P0a10,P0a11	P0b4,P0b5,P0b6,P0b9,P0b10	P0c4,P0c8,P0c9,P0c11,P0c12	P0d1,P0d2,P0d5,P0d6,P0d7,P0d9
7-	Legislation And Contracts	Course do not need specification			
8-	Projects Management	Course do not need specification			
9-	Project	Course do not need specification			
10-	Engineering Economy	Course do not need specification			

b- Optional :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
11-	Quality Control and Assurance	a8,a1,a2,a4	b5,b1,b2,b3	c4	d1
12-	Product Design and Development	Course do not need specification			
13-	Productivity Motion and Time Study	a1,a4,a8	b3,b4,b5	c7,c6	d1
14-	Statistical Quality Control	a1,a2,a4,a8	b1,b5,b6	c4	d1
15-	Advanced Operations Researches	Course do not need specification			
16-	Industrial Automation	a1,a4,a5,P0a1,P0a4,P0a5,P0a8	b1,b2,b3,P0b1,P0b3,P0b9,P0b12	c4,c5,P0c1,P0c2,P0c3,P0c6	P0d2,P0d9
17-	Machine Tool Design	a2,a5,a7,P0a4	b3,b5,b6,P0b4,P0b7	c1,P0c2,P0c3	P0d6,P0d7
18-	Design of Jigs and Fixtures	a1,a4,a7,P0a4,P0a8	b3,b5,b6,P0b3,P0b10	c1,c2,c5,P0c2,P0c3	P0d2,P0d6,P0d9,P0d7

-Third Year / (الإثحة الداخلية لكلية الهندسة بينها) / الأنتاج والتصميم / الهندسه الميكانيكيه

a- Compulsory :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Heat Transfer	a1,a2,a6,a7,P0a1,P0a3,P0a4,P0a10,P0a11	b1,b3,b5,b6,P0b1,P0b2,P0b3,P0b4	c4,P0c1,P0c2,P0c7,P0c12	P0d6,P0d9
2-	Mechanical Design	Course do not need specification			
3-	System Dynamics and Vibrations	a1,P0a1,P0a4,P0a5,P0a12	b5,P0b1,P0b2,P0b3,P0b5,b1,P0b12	c1,c5,P0c1,P0c2,P0c5,P0c6,P0c7	P0d1,P0d2,P0d5,P0d6,P0d7,P0d9
4-	Environment and Pollution	Course do not need specification			
5-	ComputerAided Design CAD	Course do not need specification			
6-	Metal Cutting Theory	a1	b1	c1	d1
7-	Advanced Machining Processes	a1,a4,P0a4,P0a8	b3,b6,P0b9,P0b12	c5,c7,P0c11	P0d1,P0d2,P0d7,P0d9
8-	Technical Report	Course do not need specification			
9-	Design of Experiments	Course do not need specification			
10-	Automatic Control	Course do not need specification			
11-	Production Management	a6,a8,P0a5	b4,b5,P0b11	c7,P0c7	d1,P0d9
12-	Thermo Fluid Machines	a1,a4	b1,b4		d1
13-	Material Engineering	a1,a2,a4	b3,b6	c7,c5	d1

b- Optional :

-Preparatory Year (الإثحة الداخلية لكلية الهندسة بينها)

a- Compulsory :

N o.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Engineering Drawing A	P0a2,P0a4,P0a8,P0a10	P0b4,P0b12	P0c2,P0c3,P0c4,P0c11	P0d1,P0d2,P0d3,P0d7
2-	Mathematics 1 A	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1	P0d7
3-	Physics A	P0a1,P0a3	P0b2	P0c1,P0c5	P0d1,P0d9
4-	Chemistry A	P0a1,P0a3	P0b1,P0b5	P0c1	P0d1,P0d9
5-	Computer Fundamentals and Programming A- Computer Fundamentals and Programming A	P0a1,P0a2,P0a5,P0a8	P0b1,P0b2,P0b3,P0b4,P0b6,P0b7,P0b8,P0b12	P0c1,P0c3,P0c5,P0c11	P0d4,P0d5,P0d6,P0d7,P0d9
6-	Technical English Language A	Course do not need specification			
7-	Production Engineering	P0a3,P0a6,P0a	P0b2,P0b5	P0c2,P0c8,P0	P0d1,P0d3

	and Workshops A	4,P0a5		c10	,P0d5
8-	Mechanics A	P0a5,P0a1	P0b2,P0b3,P0b1	P0c1	P0d1
9-	Technology and Society	P0a6,P0a7,P0a9	P0b9,P0b10	P0c10	P0d2
10-	Mathematics 1 B	P0a5,P0a1	P0b2,P0b3,P0b1	P0c1	P0d1
11-	Chemistry B	P0a1,P0a3	P0b1,P0b2,P0b4	P0c1,P0c5,P0c8	P0d1
12-	Mathematics 1 B	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1	P0d7
13-	Computer Fundamentals and Programming B	P0a1,P0a2,P0a5,P0a8,P0a10	P0b1,P0b2,P0b5,P0b7,P0b8,P0b12	P0c1,P0c3,P0c5,P0c10	P0d1,P0d4,P0d7,P0d9
14-	Technical English - Language B	Course do not need specification			
15-	Production Engineering and Workshops B	Course do not need specification			
16-	Physics B	P0a1,P0a3	P0b2	P0c1,P0c5	P0d1,P0d9
17-	Engineering Drawing B	P0a2,P0a4,P0a8,P0a10	P0b4,P0b12	P0c2,P0c3,P0c4,P0c11	P0d1,P0d2,P0d3,P0d6

b- Optional :

-First Year / (اللائحة الداخلية لكلية الهندسة ببناها) الهندسه الميكانيكيه

a- Compulsory :

No .	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Language	P0a10	P0b4	P0c12	P0d1,P0d2,P0d4,P0d5,P0d6,P0d7,P0d9
2-	Computer Applications A	P0a5,P0a8,P0a12	P0b1,P0b3	P0c5,P0c6,P0c1,P0c2	P0d4,P0d6,P0d7
3-	Mathematics 2 A	P0a1,P0a5	P0b1,P0b2,P0b3,P0b7	P0c1	P0d7
4-	Principles of Manufacturing Workshop A	P0a1,P0a3,P0a8,P0a9,P0a10	b5,P0b6	c3,c5	P0d1,P0d5
5-	Theory of Machines A	P0a1,P0a3,P0a4,P0a5	P0b1,P0b2,P0b3	P0c1,P0c2,P0c3	P0d1,P0d2,P0d3
6-	Fluid Mechanics A	P0a1,P0a3,P0a5,P0a8,P0a9,P0a12	P0b1,P0b2,P0b3,P0b4	P0c1,P0c5	P0d2,P0d5,P0d8
7-	Civil Engineering Technology	Course do not need specification			
8-	Mechanics of	P0a1,P0a2,P0a3,P	P0b7,P0b2,P	P0c1,P0c4,P	P0d1,P0d6

	Materials	0a4	0b3,P0b6	0c5	,P0d7,P0d9
9-	Mechanical Engineering Applications A	a2,a4,P0a4,P0a6,P0a8	P0b3,P0b4,P0b9	c1,P0c5,P0c6,P0c12	P0d1,P0d6,P0d9
10-	Human Rights	P0a9	P0b4		
11-	Mechanical Engineering Applications B	a1,a4,P0a4,P0a6,P0a8,P0a10	b5,P0b3,P0b4,P0b9	c1,P0c5,P0c8	P0d1,P0d2,P0d6
12-	Materials Technology	a4	b6	c7	d1
13-	Mathematics 2 B	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1	
14-	Theory of Machines B	P0a1,P0a3,P0a4,P0a5,P0a10	P0b1,P0b2,P0b3,P0b5	P0c1,P0c2,P0c3,P0c10,P0c11	P0d1,P0d2,P0d3,P0d7
15-	Fluid Mechanics B	P0a1,P0a3,P0a5,P0a8	P0b1,P0b2,P0b3,P0b4	P0c1,P0c5	P0d2,P0d5,P0d8
16-	Principles of Manufacturing Workshop B	a1,a2,P0a4,P0a8	P0b6,P0b7,P0b9	c3,P0c6	P0d1,P0d2,P0d6
17-	Computer Applications B	P0a5,P0a8,P0a12	P0b1,P0b3	P0c1,P0c2,P0c5,P0c6	P0d4,P0d6,P0d7

b- Optional :

-Second Year / (اللائحة الداخلية لكلية الهندسة ببناها) الهندسه الميكانيكيه

a- Compulsory :

No .	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Industrial Safety	a1,a5,a6,P0a6,P0a8,P0a10,P0a11	P0b6,P0b9,P0b12	c3,P0c2,P0c8,P0c9,P0c10,P0c11,P0c12	P0d2,P0d3,P0d5,P0d6,P0d7,P0d9,P0d1
2-	Electrical and Electronic Circuits	a5,P0a4,P0a5,P0a10,P0a12	b4,P0b1,P0b2,P0b3,P0b4,P0b5,P0b11	c5,P0c6,P0c9,P0c11,P0c12	P0d3,P0d6,P0d8,P0d9
3-	Mathematics 3 A	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1,P0c7	P0d7
4-	Thermodynamics A	P0a1,P0a5,P0a8,P0a10,P0a11	P0b2,P0b3,P0b4,P0b5,P0b7,P0b9,P0b11	P0c1,P0c5,P0c6,P0c11	P0d1,P0d2,P0d5,P0d6,P0d7
5-	Mechanical Systems Maintenance A	P0a8,P0a10	P0b5,P0b6	P0c5,P0c6,P0c10	P0d1,P0d3,P0d7
6-	Measurement Devices	P0a1,P0a4,P0a5,P0a8	P0b2,P0b3,P0b5	P0c1,P0c2,P0c5	P0d1,P0d2,P0d9
7-	Computer Aided Drafting A	P0a12	P0b3	P0c6	P0d1
8-	Mechanics and Testing	P0a1,P0a3,P0a4,	P0b1,P0b2,P0	P0c1,P0c2,P0	P0d1,P0d2

	of Materials	P0a5,P0a8,P0a12	b3,P0b4,P0b5,P0b6,P0b7,P0b9,P0b10	c3,P0c4,P0c5,P0c6,P0c9,P0c10,P0c11,P0c12	,P0d3,P0d5,P0d6,P0d7,P0d8,P0d9
9-	Manufacturing Technology A	P0a3,P0a8,P0a12,P0a4	P0b3,P0b4,P0b9	P0c1,P0c2	P0d2,P0d9
10-	Psychology in Industry	a1,a2,P0a5,P0a9,P0a11	P0b9,P0b10	P0c8,P0c10,P0c11	d1,P0d2,P0d5,P0d9
11-	Thermodynamic B	P0a1,P0a4,P0a5,P0a8,P0a10,P0a11	P0b2,P0b3,P0b4,P0b5,P0b7,P0b9,P0b11	P0c1,P0c5,P0c6,P0c11	P0d1,P0d2,P0d5,P0d6,P0d7
12-	Mathematics 3 B	P0a1,P0a5	P0b1,P0b2,P0b7	P0c1,P0c7	P0d7
13-	Mechanical Systems Maintenance B	P0a6,P0a8,P0a10,P0a12,P0a2,P0a3	P0b5,P0b6,P0b9,P0b12,P0b4	P0c5,P0c6,P0c8,P0c11,P0c12,P0c1	P0d1,P0d2,P0d5,P0d7
14-	Computer Aided Drafting B	Course do not need specification			
15-	Electrical Power and Machines	Course do not need specification			
16-	Manufacturing Technology B	P0a3,P0a4,P0a8,P0a12	P0b3,P0b4,P0b9	P0c1,P0c2,P0c11	P0d2,P0d9
17-	Design of Machine Elements	P0a2,P0a3,P0a4,P0a10	P0b1,P0b2,P0b3,P0b6,P0b7	P0c1,P0c2,P0c3	P0d1,P0d2,P0d4,P0d6,P0d9
b- Optional :					

Program Coordinators :

عبد الله محمد عبد الله احمد