Faculty of Engineering
at benha

Model No.13
Programme Specifications
Mechatronics Engineering
Academic Year2017 - 2018

University : Benha university
Faculty : Faculty of Engineering at benha

A- Basic information :

1. Programme title	Mechatronics Engineering
2. Programme type	Single
3. Adoption program Date	
4- Department responsible for the program	Department 1 - تكنولوجيا الهندسة الميكانيكية / Faculty of Engineering at benha

B- Specialized information :

1- General objectives of the program

1- Enable graduates to use mathematics, physical science and systems analysis tools in components and system design.
2- Students will learn engineering sciences and demonstrate the application of this knowledge to electro-mechanical systems.
3- Solve problems through course sequences focused on specific, relevant mechatronics topics leading to good working knowledge of fundamentals in mechanics, electronics, computers and software
4- Provide students with practical design experience.
5- Analyze inter-disciplinary mechanical, electrical and hydraulic systems.
6- Enable the graduate engineers to work within, lead or supervise groups of fellow engineers and technicians.
7- The program will challenge students and faculty to improve the learning process
8- Students will develop high generic skills: spoken, visual and written communication
9- Graduates should have wide choices leading to specialization in mechanics, electronics, design, computer software or other areas
10- Students will be prepared to engage in lifelong self learning process throughout their career

2- Intended learning outcomes (ILOS)

a- Knowledge and Understanding

a1- The impact of Engineering solution in a global and societal context
a2- Basic science and engineering fundamentals
a3- Fundamentals of problem identification, formulation and solution in the areas of Mechatronics
a4- The approach to design and operational performance
a5- Social, cultural, global and environmental responsibilities of the professional engineering, and the need for sustainable development
a6- The principles of sustainable design and development

b- Intellectual Capacity

b1- Apply knowledge of basic science and engineering fundamentals
b2- Undertake problem identification, formulation and solution

b3- Utilize a systems approach to design, analysis and development and practical investigations
b4- Apply the principles of sustainable design and development
b5- Full awareness of the needs to undertake lifelong learning, and capacity to do so

c- Professional Skills

c1- Compete, in-depth, in at least one engineering discipline
c2- Manage field problem, identification, formulation and solution
c3- Utilize practical systems approach to design and performance evaluation
c4- Apply the principles of sustainable design and development

d- General Skills

d1- Collaborate effectively within multidisciplinary team

3- Academic standards

1- Nars for mechatronics have been decided to be the standards of this program

4- External references for standards (Benchmarks)

1- California State University (www.csuchico.edu) (ABET)
2- Purdue University (www.pnw.edu) (ABET)
3- Sultan Qaboos University (www.squ.edu.om) (ABET)

5- Curriculum structure and contents

a - Programme duration 162

b - Prgramme Structure

1 - No of hours /No of Units :	Theoretical	162	Practical	110	Total	272
	Compulsory	150	Elective	12	Optional	
2 - Basic sciences Courses :	40			24.7%%		
3 - Social sciences and humanities courses :	16			9.8%%		
4 - Specialized courses :	44			27.3%		
5 - Other Courses :	46			28.4%		
6 - Practical/field training:	9.8%					

6- Programme courses

-Fourth Year / الهندسه الميكانيكيه / الميكاترونيات (الائحة الداخلية لكلية الهندسة ببنها)

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
م ١٤٧١	Computer Aided Manufacturing CAM	3	3	2	1	First Semster
م ١٤١٣	Hydraulic and Pneumatic Power Systems	3	3	2	1	First Semster
م ١٤٩١	Process Control with Applications	2	2	1	1	First Semster
م ١٥٠٠	Project	2	2		6	First Semster
م ١٤٠١	Field Training	1	0	0	2	First Semster
ج	Legislation And Contracts	2	2	0	0	First Semster

١٤٠١						
م ١٤٦٢	Projects Management	3	3	2	1	Second Semster
م ١٥٠٠	Project	2	2		6	Second Semster
م ١٤٨٢	Engineering Economy	2	2		1	Second Semster
م ١٤٩٢	Design of Mechatronics Systems	3	3	2	1	Second Semster

b- Optional :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
م ١٥٩٣	Mechatronics Embedded Systems	3	3	2	1	First Semster
ك ١٥٣١	Digital Control-Digital Control	3	3	2	1	First Semster
م ١٥٧٣	Industrial Automation	3	3	2	1	First Semster
ك ١٥١١	Digital Signal Processing	3	3	2	1	First Semster
م ١٥٩٨	Artificial Intelligence-Artificial Intelligence	3	3	2	1	Second Semster
م ١٥٩٦	Robotics	3	3	2	1	Second Semster
م ١٥٩٢	Hydraulic and Pneumatic Control	3	3	2	1	Second Semster
م ١٥٩٤	Machine Vision and Image Processing					Second Semster

-Third Year / الهندسه الميكانيكيه / الميكاترونيات (الائحة الداخلية لكلية الهندسة ببنها)

a- Compulsory :

code	Course Title	No.of Units	No. of hours/week			Semester
			Lect.	Excer.	Lab.	
م ١٣٦٣	ComputerAided Design CAD-ComputerAided Design CAD	3	3	2	1	First Semster
ك ١٣٣٧	Power Electronics	3	3	2	1	First Semster
م ١٣٥١	System Dynamics and Vibrations	3	3	2	1	First Semster
م ١٣٣١	Environment and Pollution	1	1	1		First Semster
م ١٣٦١	Mechanical Design	3	3	2	1	First Semster
م ١٣٢٣	Heat Transfer	3	3	2	1	First Semster
م	Design of Experiments	3	3	2	1	Second

١٣٦٤						Semster
ك ١٣٢٨	Microprocessor and Microcontrollers	3	3	2	1	Second Semster
م ١٣٠٠	Technical Report-Technical Report	1	0	0	2	Second Semster
م ١٣٨٤	Production Management	2	2	0	0	Second Semster
م ١٣٢٤	Thermo Fluid Machines	3	3	1	1	Second Semster
م ١٣٥٢	Automatic Control-Automatic Control	3	3	2	1	Second Semster
م ١٣٩٢	Introduction to Mechatronics	3	3	2	1	Second Semster

b- Optional :

-Preparatory Year (الائحة الداخلية لكلية الهندسة ببنها)

a- Compulsory :

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

	Programming B					Semster
ج ١٠١٢	Technical English Language B	1			2	Second Semster
م ١٠٧٢	Production Engineering and Workshops B	2	2	0	3	Second Semster
س ١٠٣٢	Physics B	4	4	0	2	Second Semster
م ١٠٦٢	Engineering Drawing B-Engineering Drawing B	3			3	Second Semster

b- Optional :

-First Year / الهندسه الميكانيكيه (الائحة الداخلية لكلية الهندسة ببنها)

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	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	3	3	1	1	Second

	Machines B					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 :

-Second Year / الهندسه الميكانيكيه (الائحة الداخلية لكلية الهندسة ببنها)

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 Semste
م ١٢٢٢	Thermodynamic B-Thermodynamic B	3	3	1	1	Second Semste
س ١٢١٤	Mathematics 3 B	3	3	2		Second Semste
م ١٢٨٢	Mechanical Systems Maintenance B-Mechanical Systems Maintenance B	2			4	Second Semste
م ١٢٦٤	Computer Aided Drafting B	1	0	0	2	Second Semste
ك ١٢٣٨	Electrical Power and Machines	3	3	2	1	Second Semste

م ١٢٧٢	Manufacturing Technology B-Manufacturing Technology B	2	2	1	1	Second Semste
م ١٢٦٢	Design of Machine Elements-Design of Machine Elements	3	3	0	5	Second Semste

b- Optional :

7- Programme admission requirements

1- Passing the preparatory year, first and second years of mechanical engineering department.

8- Regulations for progression and programme completion

Benha university|Faculty of Engineering at benha|الهندسه الميكانيكيه|الميكاترونيات|Fourth Year

1- For progression: passing all courses with exception of two courses at most,For completion: passing all curriculum courses.

Benha university|Faculty of Engineering at benha|الهندسه الميكانيكيه|الميكاترونيات|Third Year

2- For progression: passing all courses with exception of two courses at most

Benha university|Faculty of Engineering at benha|Preparatory Year

3- For progression: passing all courses with exception of two course at most

Benha university|Faculty of Engineering at benha|الهندسه الميكانيكيه|First Year

4- For progression: passing all courses with exception of two courses at most

Benha university|Faculty of Engineering at benha|الهندسه الميكانيكيه|Second Year

5- For progression: passing all courses with exception of two courses at most

9- Assessment rules enrolled in the program

No	**Method**	**As measured from the intended learning outcomes**
1-	Final examinations	
2-	Mini projects	
3-	Oral examinations	

10- Methods of assessment program

No	**Evaluator**	**Tool**	**Sample**
1-	1- Senior Students	Questionnaire - Interviews	50% of the students
2-	2- Alumni	Questionnaire	Not less than 20 alumni
3-	3- Stakeholders (Employers)	Workshops - Questionnaire - Interviews	Not less than 10 employers
4-	4- External Evaluator		
5-	5- Others		

11- Matrix of knowledge and skills

-Fourth Year / الهندسه الميكانيكيه / الميكاترونيات (الائحة الداخلية لكلية الهندسة ببنها)

a- Compulsory :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Computer Aided Manufacturing CAM	a4,a6,P0a4	P0b1,b3	c3,P0c3,P0c7	P0d2,P0d3,P0d6

2-	Hydraulic and Pneumatic Power Systems	a3,a4,a6	b1,b2,b3,b4	c4	
3-	Process Control with Applications	a2,a4,P0a1,P0a4,P0a5,P0a8	b1,P0b1,P0b2,P0b4	c3,P0c1,P0c2,P0c3,P0c5,P0c8	P0d1,P0d2,P0d3,P0d7,P0d8
4-	Project	Course do not need specification			
5-	Field Training	Course do not need specification			
6-	Legislation And Contracts	Course do not need specification			
7-	Projects Management	a2,a4	b3,b4,b2	c1,c2	d1
8-	Project	Course do not need specification			
9-	Engineering Economy	Course do not need specification			
10-	Design of Mechatronics Systems	a3,a4,P0a4,P0a5,P0a8,P0a12	b1,b2,b3,b4,P0b2,P0b3	P0c1,P0c2,c2,c3,P0c5,P0c7	P0d2,P0d3,P0d6,P0d7

b- Optional :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
11-	Mechatronics Embedded Systems	a3,a4,a5,a6,P0a1,P0a2,P0a4,P0a5,P0a8,P0a12	b2,b3,b4,b5,P0b1,P0b2,P0b5,P0b7,P0b8,P0b9,P0b10,P0b12	c1,c2,c3,c4,P0c1,P0c2,P0c4,P0c5,P0c6,P0c8,P0c9,P0c11,P0c12	P0d1,P0d2,P0d3,P0d4,P0d5,P0d6,P0d7,P0d8,P0d9
12-	Digital Control	a4,a6,P0a4	b3,b4	c2,c3,c4,P0c2,P0c3	P0d6,P0d8
13-	Industrial Automation	Course do not need specification			
14-	Digital Signal Processing	Course do not need specification			
15-	Artificial Intelligence	a3,a4,P0a1,P0a4,P0a5	b3,b2,P0b1,P0b2,P0b7	c2,c3,P0c2,P0c5	P0d3,P0d7,P0d8,P0d6
16-	Robotics	a3,a4,a5,a6,P0a1,P0a2,P0a4,P0a5,P0a8,P0a12	b2,b3,b4,b5,P0b1,P0b2,P0b5,P0b7,P0b8,P0b9,P0b10,P0b12	c1,c2,c3,c4,P0c1,P0c2,P0c4,P0c5,P0c6,P0c8,P0c9,P0c11,P0c12	P0d1,P0d2,P0d3,P0d4,P0d5,P0d6,P0d7,P0d8,P0d9
17-	Hydraulic and Pneumatic Control	Course do not need specification			
18-	Machine Vision and Image Processing	Course do not need specification			

-Third Year / الهندسه الميكانيكيه / الميكاترونيات (الائحة الداخلية لكلية الهندسة ببنها)

a- Compulsory :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	ComputerAided Design CAD	a2,P0a1,P0a4	b1,b3,P0b1,P0b8	c4,P0c5,P0c7	P0d4,P0d6,P0d7
2-	Power Electronics	P0a5,P0a8,P0a10	b1,b2,P0b1,	P0c3,P0c5,P0	P0d1,P0d2,P

		,P0a12	P0b2,P0b3,P0b4,P0b5,P0b6	c6,P0c7,P0c9,P0c12	0d3,P0d6,P0d8,P0d9
3-	System Dynamics and Vibrations	Course do not need specification			
4-	Environment and Pollution	Course do not need specification			
5-	Mechanical Design	Course do not need specification			
6-	Heat Transfer	a2,a3,a6,P0a1,P0a10,P0a11	b1,b4,P0b1,P0b2,P0b3,P0b4	P0c1,P0c2,P0c7,P0c12	P0d6,P0d9
7-	Design of Experiments	a2,a3,a4	b1,b2	c3,c2	d1
8-	Microprocessor and Microcontrollers	P0a4,P0a5,P0a8,P0a10,P0a11,P0a12	b1,P0b3,P0b4,P0b5,P0b2	c2,P0c3,P0c6,P0c9,P0c11,P0c12,c3	P0d1,P0d2,P0d3,P0d6,P0d8,P0d9
9-	Technical Report	Course do not need specification			
10-	Production Management	Course do not need specification			
11-	Thermo Fluid Machines	Course do not need specification			
12-	Automatic Control	a2,P0a1,P0a12	P0b5,P0b11,P0b6,P0b1	c3,P0c2,P0c3,P0c5,P0c7	P0d2,P0d3,P0d7
13-	Introduction to Mechatronics	a3,a4,a5,a6,P0a1,P0a2,P0a4,P0a5,P0a8,P0a12	b2,b3,b4,b5,P0b1,P0b2,P0b5,P0b7,P0b8,P0b9,P0b10,P0b12	c1,c2,c3,c4,P0c1,P0c2,P0c4,P0c5,P0c6,P0c8,P0c9,P0c11,P0c12	P0d1,P0d2,P0d3,P0d4,P0d5,P0d6,P0d7,P0d8,P0d9

b- Optional :

-Preparatory Year (الائحة الداخلية لكلية الهندسة ببنها)

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 :

-First Year / الهندسه الميكانيكيه (الائحة الداخلية لكلية الهندسة ببنها)

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	P0b6		P0d1,d1,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	P0a4,P0a6,P0a8	P0b3,P0b4,P0b9	P0c5,P0c6,P0c12	P0d1,P0d6,P0d9
10	Human Rights	P0a9	P0b4		

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11 -	Mechanical Engineering Applications B	P0a4,P0a6,P0a8,P0a10	P0b3,P0b4,P0b9	P0c5,P0c8	P0d1,P0d2,P0d6
12 -	Materials Technology	a2,a6,a1	b1,b4	c4	
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	P0a4,P0a8	P0b6,P0b7,P0b9	P0c6	P0d1,P0d2,P0d6
17 -	Computer Applications B	P0a5,P0a8,P0a12	P0b1,P0b3	P0c1,P0c2,P0c5,P0c6	P0d4,P0d6,P0d7

b- Optional :

-Second Year / الهندسه الميكانيكيه (الائحة الداخلية لكلية الهندسة ببنها)

a- Compulsory :

No.	Course Title	Knowledge and Understanding	Intellectual capacity	Professional skills	General Skills
1-	Industrial Safety	a5,P0a6,P0a8,P0a10,P0a11	b5,P0b6,P0b9,P0b12	P0c2,P0c8,P0c9,P0c10,P0c11,P0c12	P0d2,P0d3,P0d5,P0d6,P0d7,P0d9,P0d1
2-	Electrical and Electronic Circuits	a2,a4,P0a4,P0a5,P0a10,P0a12	b1,b2,b3,P0b1,P0b2,P0b3,P0b4,P0b5,P0b11	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 of Materials	P0a1,P0a3,P0a4,P0a5,P0a8,P0a12	P0b1,P0b2,P0b3,P0b4,P0b5,P0b6,P0b7,P0b9,P0b10	P0c1,P0c2,P0c3,P0c4,P0c5,P0c6,P0c9,P0c10,P0c11,P0c12	P0d1,P0d2,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	a5,P0a5,P0a9,P0a11	b5,b2,P0b9,P0b10	c1,c2,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 :

Nader abd el wahab mansour