



PROGRAM ANNUAL REPORT (2020-2021)



Benha University

Faculty of Engineering at Shoubra

Energy and Sustainable Energy Engineering Program Department

B. Sc. Energy and Sustainable Energy Engineering

A. Basic Information

- (1) Programme title: B. Sc. Energy and Sustainable Energy Engineering Program
- (2) Program Type: Double
- (3) Department: Mechanical Engineering department
- (4) Coordinator: Prof. Dr. Ahmed Reda El Shami
- (5) External evaluator: Prof Dr.Eman El Mahlawy
- (6) Last date of program specifications approval: 20-9-2021

B. Statistical information

- (1) No. of students enrolled in the programme: 100
- (2) Ratio of the students enrolled in the program this year to those who enrolled in the previous level: (see table)
- (3) Number of students and percentage of success : 100

Academic year	No. Student
Level 0	4
Level 1	23
Level 2	25
Level 3	16
Level 4	30

- (4) No. of students who fulfilled the program and their percentage to those who were enrolled (see table)
- (5) Grading: in terms of number of students and percentage

Grade	Student percentage	Grade	No. Points	Student number
Excellent	More than 97%	A+	4.0	0
	From 93% to less than 97%	A	4.0	0
	From 89% to less than 93%	A-	3.7	2
Very good	From 84% to less than 89%	B+	3.3	4
	From 80% to less than 84%	B	3	11
Good	From 76% to less than 80%	B-	2.7	13
	From 73% to less than 76%	C+	2.3	24
	From 70% to less than 73%	C	2.0	25
Pass	From 67% to less than 70%	C-	1.7	16
	From 64% to less than 67%	D+	1.3	2
	From 60% to less than 64%	D	1.0	1
Fail	Less than 60%	F	0.0	0



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Academic year	Grade	Grade	N ^o of Points	N ^o of students	
Level 0	Excellent	A ⁺	4.00	0	0
		A	4.00	0	
		A ⁻	3.70	0	
	Very good	B ⁺	3.30	0	0
		B	3.00	0	
	Good	B ⁻	2.70	0	3
		C ⁺	2.30	0	
		C	2.00	3	
	Pass	C ⁻	1.70	1	1
		D ⁺	1.30	0	
D		1.00	0		
Fail	F	0.00	0	0	

Academic year	Grade	Grade	N ^o of Points	N ^o of students	
Level 1	Excellent	A ⁺	4.00	0	0
		A	4.00	0	
		A ⁻	3.70	0	
	Very good	B ⁺	3.30	2	3
		B	3.00	1	
	Good	B ⁻	2.70	2	13
		C ⁺	2.30	9	
		C	2.00	2	
	Pass	C ⁻	1.70	4	7
		D ⁺	1.30	2	
D		1.00	1		
Fail	F	0.00	0	0	

Academic year	Grade	Grade	N ^o of Points	N ^o of students	
Level 2	Excellent	A ⁺	4.00	0	1
		A	4.00	0	
		A ⁻	3.70	1	
	Very good	B ⁺	3.30	0	2
		B	3.00	2	
	Good	B ⁻	2.70	0	18
		C ⁺	2.30	6	
		C	2.00	12	
	Pass	C ⁻	1.70	4	4
		D ⁺	1.30	0	
D		1.00	0		
Fail	F	0.00	0	0	



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Academic year	Grade	Grade	N ^o of Points	N ^o of students	
Level 3	Excellent	A ⁺	4.00	0	0
		A	4.00	0	
		A ⁻	3.70	0	
	Very good	B ⁺	3.30	0	2
		B	3.00	2	
	Good	B ⁻	2.70	3	12
		C ⁺	2.30	2	
		C	2.00	7	
	Pass	C ⁻	1.70	2	2
		D ⁺	1.30	0	
		D	1.00	0	
Fail	F	0.00	0	0	

Academic year	Grade	Grade	N ^o of Points	N ^o of students	
Level 4	Excellent	A ⁺	4.00	0	1
		A	4.00	0	
		A ⁻	3.70	1	
	Very good	B ⁺	3.30	2	8
		B	3.00	6	
	Good	B ⁻	2.70	8	16
		C ⁺	2.30	7	
		C	2.00	1	
	Pass	C ⁻	1.70	5	5
		D ⁺	1.30	0	
		D	1.00	0	
Fail	F	0.00	0	0	



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C. Academic standards

1. Achievement of program Intended Learning Outcomes:

List of University Requirements (16 Credit Hours)

No.	Code	Course	CR	Pre Req.
(A) Humanities & Social Science (Univ. Req.)				
1	GEN099	English Language (A Remedial Course)	0	-
2	GEN101	English Language	2	GEN099
3	GEN102	Engineering & Society	2	-
4	GEN201	Technical Report Writing	2	GEN101
5	GEN202	Psychology & organization Behavior	2	-
6	GEN301	Leadership and Management Skills	2	-
7	GEN302	Professional Ethics	2	-
8	GEN401	Legislations, contract and procurement management	2	-
9	GEN402	Human Resources Management	2	-

List of Faculty Requirements (39 Credit Hours)

No.	Code	Course	CR	Pre Req.
(B) Basic Engineering Sciences (Faculty/Spec. Req.)				
1	MDP101	Engineering Drawing (1)	3	-
2	MDP102	Engineering Drawing (2)	3	MDP101
3	MDP103	Production Technology & Workshops	3	-
4	EMP101	Engineering Mathematics (1)	3	-
5	EMP102	Engineering Mathematics (2)	3	EMP101
6	EMP201	Engineering Mathematics (3)	3	EMP102
7	EMP202	Engineering Mathematics (4)	3	EMP201
8	CPE101	Computer Programming	3	-
9	EMP103	Physics (1)	3	-
10	EMP104	Physics (2)	3	EMP103
11	EMP105	Engineering Chemistry	3	-
12	EMP106	Engineering Mechanics (1)	3	-
13	EMP107	Engineering Mechanics (2)	3	EMP106



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List of Mathematics & Basic Science Requirements (38 Credit Hours)

(C) Mathematics & Basic Science							
No.	Code	Course	CR	Lec	Tut	Lab	Pre Req.
1	MPE201	Thermodynamics	3	2	-	3	EMP103
2	MDP201	Materials Science	3	2	-	3	EMP105
3	MDP212	Manufacturing Technology	2	1	-	3	MDP103
4	EMP203	Physics (3)	3	2	2	-	EMP104
5	MPE202	Fluid Mechanics	3	2	-	3	EMP103
6	MDP204	Mechanics & Testing of Materials	3	2	-	3	MDP201
7	MPE301	Heat & Mass Transfer	3	2	-	3	MPE201
8	EPM201	Electrical Engineering I	3	2	2	-	EMP103
9	EMP311	Organic Chemistry	2	1	2	-	EMP105
10	MPE303	Measurements & instrumentation Systems	3	2	-	3	EMP104
11	ELC301	Electronic Engineering	3	2	2	-	EPM301
12	MDP312	Theory of Machines	2	1	2	-	EMP107
13	EPM301	Electrical Power Engineering	3	2	2	-	EPM201
14	EPM302	Electrical Engineering II	2	1	2	-	EPM201

List of Applied Engineering & Design Requirements (38 Credit Hours)

(D) Applied Engineering & Design							
No.	Code	Course	CR	Lec	Tut	Lab	Pre Req.
1	MPE302	Applied Fluid Mechanics	3	2	2	-	MPE202
2	MPE304	Applied Thermodynamics	3	2	2	-	MPE201
3	ESE411	Sustainable Energy Utilization	2	1	2	-	MPE201
4	EPM401	Electrical Machines	3	2	-	3	EPM301
5	MPE401	Applied Heat & Mass Transfer	3	2	-	3	MPE301
6	ESE404	Bioenergy	3	2	2	-	EMP301
7	ESE405	Solar Energy	3	2	2	-	ESE401
8	EPM402	Power System Analysis	3	2	2	-	EPM301
9	ESE502	Wind Energy	3	2	2	-	MPE302
10	ESE503	Solar Cells Fundamentals	3	2	2	-	ESE405
11	ESE504	Power Stations	3	2	2	-	MPE304
12	ESE506	Energy Storage & Transmission	3	2	2	-	ESE403, ESE501
13	ESE403	Energy & Conservation Management	3	2	2	-	ESE401



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List of Computer Application & ICT Requirements (16 Credit Hours)

(E) Computer Application & ICT							
No.	Code	Course	CR	Lec	Tut	Lab	Pre Req.
1	MDP203	Computer Aided Mechanical Drawing	3	2	-	3	MDP102
2	EPM501	Power Electronics	3	2	-	3	ELC301
3	MPE305	Numerical Methods for Engineers	3	2	-	3	EMP202
4	ESE511	Energy Economics	2	1	2	-	ESE401
5	MDP501	Control Systems analysis & Design	3	2	-	3	MDP401
6	ESE525	Computer Applications in Fluid Mechanics	2	1	-	3	MPE305,MPE302

List of Project & Practice Requirements (16 Credit Hours)

(F) Project & Practice							
No.	Code	Course	CR	Lec	Tut	Lab	Pre Req.
1	ESE591	PROJECT (1)	3	3	-	-	120 CR
2	ESE592	PROJECT (2)	3	3	-	-	ESE591
3	MDP311	Machine Components Design	2	1	2	-	MDP204
4	MDP401	Vibration & Dynamics	3	2	-	3	MDP302
5	ESE402	Fuel & Advanced Combustion	3	2	-	3	MPE304
6	ESE 380	Field Training I	1	1	-	-	80 CR
7	ESE 480	Field Training II	1	1	-	-	120 CR

List of Elective Subjects Requirements (12 Credit Hours) "Student choose 4 only from the following"

(G) Elective Subjects							
No.	Code	Course	CR	Lec	Tut	Lab	Pre Req.
1	ESE410	Hydraulic and Pneumatic systems	3	2	2	-	MPE302
2	ESE411	Selected topics in sustainable energy	3	2	2	-	---
3	ESE412	Air Conditioning & Refrigeration and Environmental Control	3	2	2	-	MPE301
4	ESE413	Internal Combustion Engines	3	2	2	-	ESE402
5	ESE510	Energy Management	3	2	2	-	ESE403
6	ESE511	Marine Energy Systems	3	2	2	-	ESE401
7	ESE512	Geothermal Energy	3	2	2	-	ESE401
8	ESE513	Dynamic Uninterruptible Power Supply System	3	2	2	-	EPM401



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2. Achievement of program outcomes

Since all program aims based on the acquisition of knowledge, therefore the achievement of program aims is 100%

3. Student Assessment Methods

- Written exams
- Online exams
- Oral exams
- Quizzes
- Lab exam
- Take home exam
- Research assignments
- Report assignments
- Project assignments
- In – class questions

4. Student achievement

- Getting supported materials through searching in the internet.
- Training on laboratory instruments and testing machines.
- Preparing power point presentations for some courses.
- Field research and data collection from project sites
- Field trips to demonstrate some of the taught topics
- Field training

5. Quality of teaching and learning opportunities

- Laboratories for solar and wind energy, computer lab are available
- Data show equipment is available for face to face lectures

6. Effectiveness of student support systems

- Excellent for some courses
- Other courses still need more attention



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7. Learning resources

a) No. of faculty members and their assistants and their ratio to students

- No. of faculty members (22) and their assistants (1)
- Total No. of students – five levels – (98)
- Ratio of faculty members to students (1 : 12)
- Ratio of their assistant to students (1 : 9)

b) Matching of faculty members' specialization to programme needs

- Most of the specialist staff members are available, even some of humanities courses are taught by department staff members.
- Variety of practical and professional experience of staff members locally and abroad in design, consultancy, construction, project evaluation, contracts, cost estimation, project monitoring, quality assurance, follow-up, environmental studies, managerial, and ministry works.

c) Availability and adequacy of program handbook

- Soft copy for each subject is available for students.
- Adequacy of library facilities
- Adequacy of laboratories
- References are available in Library, but need update

d) Adequacy of computer facilities

معمل الحاسب الخاص بالبرنامج يحتوى على 30 جهاز كمبيوتر و مزودة بالبرامج التى يحتاجها الطلاب مثل برنامج الماتلاب و كل طالب يجلس على جهاز منفردا.

e) Adequacy of field/practical training resources

- فى لائحة البرنامج المحدثة 2016 تم إدراج ساعة معتمدة للتدريب الميدانى الاول و يشترط اجتياز الطالب 80 ساعة و ساعة معتمدة أخرى للتدريب الثانى و يشترط اجتياز الطالب 120 ساعة و تم اعتماد تشكيل لجنة إشراف ثلاثية بمجلس البرنامج (83) بتاريخ 2020-11-10 و التصديق على هذا التشكيل بمجلس كلية رقم (2) بتاريخ 2020-11-17 و من تقوم اللجنة بمناقشة كل طالب و درجات المناقشة 40 درجة و يقدم الطالب تقرير بشأن مدى إستفادته و يتم تقييم اللجنة للتقرير من 50 درجة و يقدم الطالب الى اللجنة نموذج متابع من جهة التدريب و يحتوى النموذج على توقيعات حضور الطالب و ختم جهة التدريب و تقييم الجهة للطالب من 10 درجات.
- يتم رصد تقييم لجنة الإشراف فى نتيجة الطالب و تحتسب من المعدل التراكمى للطالب و بذلك يكون التدريب الميدانى شرطا للتخرج لانه يمثل ساعة معتمدة لكل تدريب و يجب اجتيازها ضمن مجموع عدد ساعات البرنامج (175 ساعة)

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f) **Adequacy of any other programme needs**

- Nothing is needed

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8. Quality management and enhancement

a) **Availability of regular evaluation and revision system for the program**

b) **Availability of regular evaluation and revision system for the program**

- This is the second year for evaluation and revision.

b) **Effectiveness of the system**

- The staff members are cooperating effectively in the system

c) **Effectiveness of faculty and university laws and regulation for progression**

- Fair.

d) **Effectiveness of programme external evaluation system:**

i. External evaluators

- Prof. Dr. Iman Elmahalawy (Prof. of Mechanical Engineering- Cairo University)

ii. Students

- Through questionnaires – analysis is under progress to deduce conclusions and give recommendations.

iii. Other stakeholders

- A survey was made of some manufacturing companies and consulting firms, during last year's employment (recruitment) fair and throughout the present academic year. Results are being assembled and analyzed and conclusions drawn.

e) **Faculty response to student and external evaluations**

- Fair

9. Proposal of program development

a) **Program structure (units/ credit hours)**

Program duration: (5-Levels), 10 semesters

Program structure: Contact hours system

No. of credit hours: 175

(Contact Lectures: 122, contact tutorial /Exercises: 60, contact lab: 69)

Indicative curricula Content by Subject Area



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	Subject Area	CR	%	NARS Requirements
A	Humanities and Social Sciences (Univ. Req.)	16	9.14	9-12%
B	Mathematics and Basic Sciences	38	21.71	20-26%
C	Basic Engineering Sciences (Faculty/Spec. Req.)	39	22.29	20-23%
D	Applied Engineering and Design	38	21.71	20-22%
E	Computer Applications and ICT	16	9.14	9-11%
F	Projects and Practice	16	9.14	8-10%
G	Electives subjects	12	6.86	6-8%
		175	100	

b) Courses, deletions and additions and modifications

– Non

c) Requirements for the skill improvement of the staff and assistants

- شبكة الانترنت بالبرنامج ضعيفة و تحتاج الى تقوية
- المراجع و الدوريات بمكتبة الكلية تحتاج الى تحديث

10. Progress of previous year's action plan

Action Identified	Person Responsible	Progress of action	Reasons for non completion
توفير احتياجات البرنامج (ماكينة تصوير + أدوات كتابة و غيرها)	إدارة الكلية	complete	--

11. Action plan

Action required	Person responsible	Completion date	Any cost implication (estimate)
شبكة الانترنت بالبرنامج ضعيفة و تحتاج الى تقوية	ادارة الكلية	-	-
المراجع و الدوريات بمكتبة الكلية تحتاج الى تحديث		-	-

Program Coordinator: Prof. Dr. Ahmed Reda ElShami