The Ministry of Higher Education
& Scientific Research
University of Mosul
College of Science
Department of New and Renewable Energies

Self-evaluation

New and Renewable Energies Department Report

According to ABET Standards

2023-2024

https://uomosul.edu.iq/en/science/department-of-new-and-renewable-energies/

Prepared by

Dr. Ibtisam Yahya Abdullah

https://uomosul.edu.iq/science/

Department of New and Renewable Energies

Contents

Introduction

According to the directives of the Honorable Minister of Higher Education and Scientific Research on the necessity of developing universities and educational institutions, his Excellency instructed the establishment of a center for ensuring quality and reliability through which the scientific services provided by the ministry and its educational institutions are matched with international quality standards, taking into account the current and future needs of Iraqi society, with the aim of graduating qualified cadres capable of meeting these needs.

Based on the commitment of the Department of New and Renewable Energies/College of Science/University of Mosul to consolidate and apply quality practices to support the university's mission towards achieving its strategic goals and reaching global leadership, a self-evaluation report was written.

Self-evaluation according to the "ABET Accreditation Standards" is an examination of the overall functions and activities of the department, taking into account the mission and goals of the department, justifying the analysis extensively with conclusions and evidence, and taking advice from others who are able to provide independent comments. The responsibility for conducting the self-study falls on those in charge of the department, so that everyone is committed to conducting an objective, subjective, and scientific evaluation, and evaluation is an effective means of reviewing the strengths and weaknesses of the department.

The goal of the report is to make changes that contribute to raising the level of performance, supporting strengths, and eliminating weaknesses through work that achieves the standards of the ABET accreditation program, giving a comprehensive overview of the level of activities, services, and educational programs provided by the department, knowing the levels of students, and ways to improve the educational reality, and determining what... They need training courses and development

programs and ensuring the quality of the department's outputs and programs to ensure the effectiveness of ongoing quality processes and procedures.

Report preparation methodology

The methodology for preparing the self-evaluation report for the Department of New and Renewable Energies/College of Science was based on ABET program accreditation standards and on the participatory work of department officials and in direct coordination with the Quality Assurance Department at the college. Electronic workshops were started to clarify how to work with the standards while discussing ways and mechanisms of work and starting to write the self-report. For the section to be the basic building block from which the final self-evaluation report will emerge.

The guiding bodies for preparing the report, headed by Prof. Assem Ahmed Issa and MD membership Ibtisam Yahya Abdullah. The bodies supporting the writing of the self-report were, respectively, the New and Renewable Energies Department/Quality Assurance Unit/Deanship of the College of Science.

Mechanism for involving academic and administrative units and students in implementing the study

After the department identified the comprehensive model in preparing the self-evaluation study, it determined the organizational structure of the committee supervising the self-evaluation study, and the work teams in accordance with the quality management system applied in it, so that the department defined the organizational structure as follows:

- ✓ Consideration as a supervisor for the self-evaluation study.
- ✓ Forming a mini-follow-up committee in the department, to assist the work team, follow up on the groups implementing the study, and coordinate among them.

- ✓ Four groups were formed, each group studying and evaluating standards in the field assigned to their work
- ✓ An action plan has been identified for the work groups, within the performance standards that must be adopted in evaluating the extent to which each of the standards has been achieved.
- ✓ Holding a group of workshops attended by members of the teams, and supervised by the department, to explain the mechanisms of the groups' work, methods of analyzing available data and data, the methodology for issuing evaluative judgments, and formulating conclusions, and how to prepare the final report.

Tools for collecting information to prepare the report

The following tools were used to prepare the report:

- ✓ Vision, mission and goal.
- ✓ ABET Standards Guide.
- ✓ Book of laws, regulations and instructions of the Ministry of Higher Education.
- ✓ Annual and executive plans, decisions, records, procedures, and forms.
- ✓ Questionnaires, personal interviews, meeting minutes, periodic reports, quarterly reports, and annual reports
- ✓ Studies, research, and completed development projects.

Chapter I

Description of New and Renewable Energies Department

General Information:

Department Contact Information:

Name of the Institution: Ministry of Higher Education/University of Mosul/ College of Science/ New and Renewable Energies Department
Website: https://uomosul.edu.iq/en/science/New and Renewable Energies - department/
Type of Institution: Governmental
Establishment date: 1964
Dates of: Undergraduate Studies: 2013
Language of Study: English.
Duration of Undergraduate: 4 years.

Head Department:

Assist. Prof. Dr. Asim Ahmed Issa Muhammad Suleiman

Iraq- Mosul- University of Mosul- College of Science- New and Renewable Energies Dept.

Mobile: 07505532620

Email: :assim.ahmed@uomosul.edu.iq

History, Demonstration, Scope of Activities, and Achievements of the Department:

The department was established in 2013. Since then, the department has sought to expand over the years to include new and renewed energies for the academic degrees awarded by the department as research assistants.

The Department of New and Renewable Energies is one of the scientific departments of the College of Science at the University of Mosul. The duration of study is four years. The department grants a bachelor's degree in energy sciences and renewable energies after the student has been prepared scientifically and methodologically, qualifying him to keep pace with technical progress in the field of scientific research and providing services to the public and private sectors. Study in the department is in English.

The department aims to introduce students to the types of green and clean energies that are an alternative to traditional energy. These energies include solar energy, wind energy, biomass energy, hydropower, and geothermal energy. Four batches of department students have graduated.

Vision, Message, and Goals of the Department:

Vision

Studying the types of new and renewable energies and preparing a generation that is aware of the culture of renewable energy and is ready to use it as the basis for most of the energy in society, by providing an academic program and supplying society with distinguished graduates capable of dealing with the modern changes and developments taking place in the world and contributing to the development of scientific, health, industrial and environmental institutions in solving the problems that arise. Obstructs her progress.

Mission

The Department of New and Renewable Energies sought to create a generation capable of keeping pace with progress and development in basic sciences and their various applications and exploiting nature to produce green energy through:

1. Preparing cadres specialized in energy sciences and their applications and qualifying graduates specialized in the fields of energy and familiarity with the theoretical foundations of energy sciences and their field applications to work in scientific, research, educational, and industrial centers.
2. Providing students with educational skills by studying renewable energies of various types.
3. Increasing community knowledge of the benefits of renewable energy.
4. Deepening national loyalty and preserving the principles of society and noble human values.

Objectives

Department objectives:

The New and Renewable Energies Department sought to achieve the following goals to reach the national classification:

The department aims to introduce students to the types of green and clean energies that are an alternative to traditional energy. These energies include solar energy, wind energy, biomass energy, hydropower, and geothermal energy. It seeks to achieve the following goals to reach the national classification:

First: General objectives:

1. Keeping pace with global development in all scientific fields related to energy and renewable energies.

2. Providing society and state institutions with scientific and technical expertise in the field of energy sciences and renewable energies and developing its scientific, health, and environmental institutions.
3. Raising the level of performance and quality to the ranks of advanced international universities.

Second: Educational objectives:

1. Developing and updating theoretical and practical scientific curricula.
2. Developing the academic competencies and performance of teachers and students.

Third: Objectives of scientific research:

1. Finding alternatives to traditional energies and replacing them with clean energy.
2. Investing in energy research and sustainable development to develop scientific, health, industrial, and environmental institutions.
3. Working to address energy-related problems in Iraq and finding appropriate solutions to obtain green energy at the lowest costs.

Fourth: Objectives of community service:

1. Supporting community activities by holding seminars, workshops, and scientific courses related to energy and renewable energies.
2. Expanding general horizons related to the importance of energy and renewable energies in solving many environmental and industrial problems for the advancement of society.

Fifth: Objectives of student activity:

Ability to work in a multidisciplinary team:

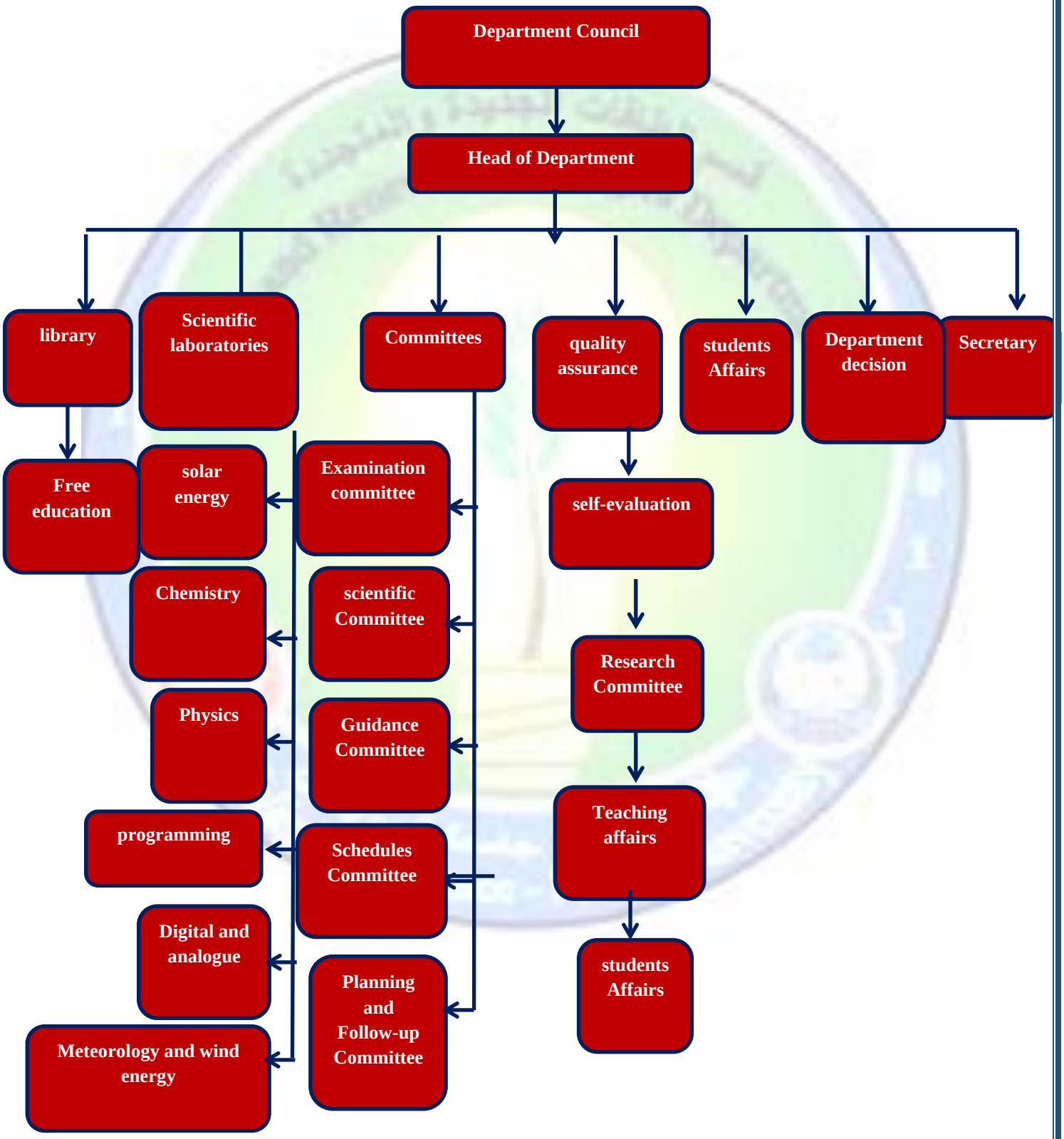
1. Supporting student, cultural, social, sporting, and artistic activities.

2. Knowledge, cultural, and scientific exchange with other local and international universities.
3. Holding a scientific conference for graduation projects and honoring the distinguished ones.
4. Ability to communicate constructively.

Description of Department

The Department of New and Renewable Energies is one of the scientific departments of the College of Science at the University of Mosul. The Department of New and Renewable Energies was established in the year 2013. The duration of the study is four years. The department grants a bachelor's degree in energy sciences and renewable energies after the student has been prepared scientifically and methodologically, qualifying him to keep pace with technical progress in the field of scientific research and providing services to the public and private sectors. Study in the department is in English. The department aims to introduce students to the types of green and clean energies that are an alternative to traditional energy. These energies include solar energy, wind energy, biomass energy, hydropower, and geothermal energy. Four batches of department students have graduated.

Organizational and Administrative Structure of New and Renewable Energies Dept.:



Heads of the Department:

Prof. Dr. Issam Gamal El-Din Nouri	**(2013-2015)**
Dr. Faisal Hamadi Ali	**(2015-2017)**
Prof. Dr. Mohamed Salah El-Din Abdel-Faraj	**(2017-2020)**
assist. Prof. Dr Asim Ahmed Issa	**(2020 - until now)**

The number of teaching staff in the department who hold doctorates and master's degrees is (26), and the number of employees is (7).

(٦) batches of bachelor's degree holders in new and renewable energies were graduated.

Number of teaching staff according to academic title:

Professor Doctor (1), Assistant Professor Doctor (4), Assistant Professor Master (2), Lecturer Doctor (7), Master Lecturer (7), Assistant Lecturer (5), Bachelor's (4), Diploma (1), Medium (2)

- The number of graduates since the founding of the department until now is (189) students
- Number of classrooms (four halls)
- Number of scientific laboratories in the department (6)
- Department Library (1).

The department's most notable achievements:

1- Opening and equipping the solar energy laboratory

2- Increasing the capacity of classrooms

3- Create a logo for the department

4- Opening the library and equipping it with shelves and a calculator

5- Opening the computer laboratory and equipping it with several computers

6- Equipping several laboratories with counters

7- Equipping the department with curtains for laboratories, classrooms, and administration rooms, except teaching rooms

8- Installing an iron door for the examination committee

9- Installing surveillance cameras in the department

10- Installing boards with the names of the department's teaching staff in their rooms in the department

11- Equipping the department with an electric generator

Members of Department's Council:

No.	Name	
1	Asst. prof. Dr. Assim Ahmed Issa	chief
2	Asst. prof. Dr. Alla Asmaieal Ayoub	A member
3	Asst. prof. Basher Khalel Ahmed	A member
4	Asst. prof. Dr. Hazim Saleh Ahmed	A member
5	Asst. prof. Dr. Lubna Abd Alazzez Saleh	A member
6	Lec. Duaa Hassan Yahya	A member

Staff Academic (scientific structure of the department/ teachers) 2022-2023

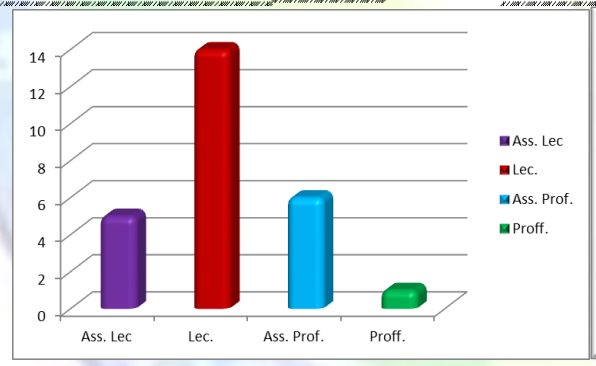
No.	Name	General specialization	Specialization	The scientific title
1.	Asim Ahmed Issa Muhammad Al-Abdali	physics	Nano physics	Assistant Professor
2.	Alaa Ismail Ayoub Zidane	chemistry	organic chemistry	Assistant Professor
3.	Bashir Khalil Ahmed Hassan	physics	solar energy	Assistant

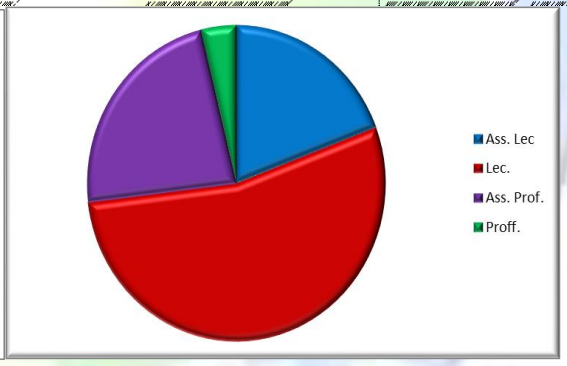
				Professor
4.	Lubna Abdel Aziz Saleh	chemistry	Oil chemistry	Assistant Professor
5.	Lamia Adnan Najeeb Sarsam	chemistry	Analytical chemistry	Assistant Professor
6.	Hazem Saleh Ahmed Hilal Al-Hadidi	physics	Molecular physics	Assistant Professor
7.	Thana Yacoub Youssef	chemistry	Inorganic chemistry	Assistant Professor
8.	Saad Fadel Mahmoud Jassim Al-Hayali	chemistry	Physical chemistry	Teacher
9.	Ghada Ghanem Younis Majeed Al-Taie	physics	Solid state physics	Teacher
10.	Hamed Abdullah Saleh	chemistry	Industrial chemistry	Teacher
11.	Ibtisam Yahya Abdullah	physics	Smart materials	Teacher
12.	Mead Salem Younis Thanoun Al-Hadidi	physics	Nano physics	Teacher
13.	Muhammad Mahmoud Younis Al Nuaimi	physics	Solid state physics	Teacher
14.	Nagham Salem Muhammad	computer Sciences	Computer vision	Teacher
15.	Zahraa Badie Ibrahim Khalil Al-Dabbagh	physics	Solid state physics	Teacher
16.	Rana Hisham Mahmoud Al-Abaji	physics	Nuclear Physics	Teacher
17.	Hassan Yahya's prayer	chemistry	Analytical chemistry	Teacher
18.	Zainab Walid Majed	chemistry	Analytical chemistry	Teacher
19.	Maymouna Khaled Qasim		Physical chemistry	
20.	Mustafa Hussein Ibrahim Mahmoud	electrical	Renewable	Teacher

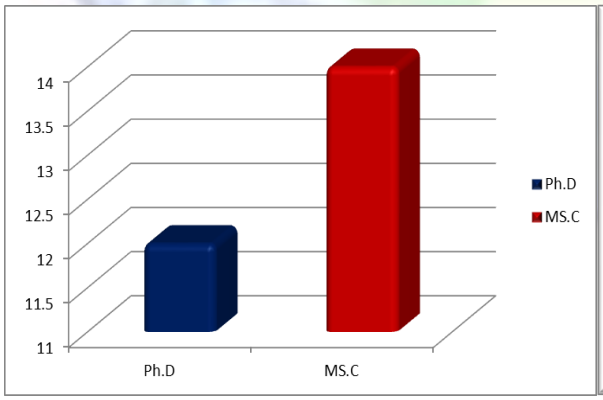
		engineering	energy	
21.	Zakaria Abdel Wahed Hamid	computer science	Artificial intelligence	assistant teacher
22.	Sarah Khaled Saeed	chemistry	Industrial chemistry	assistant teac
23.	Enas Abdel Qader Hassan Tawfiq	chemistry	Organic chemistry	assistant teac
24.	Hala Mounir Yahya Othman	chemistry	Inorganic chemistry	assistant teac
25.	Salah Afdo Ali Maho	Law	Law	assistant teac
26.	Waheed Abdi Sheikho	Physics	Nuclear Physics	

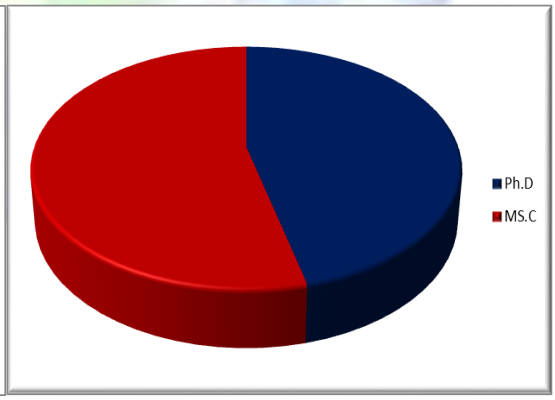
Academic staff (title, degree, and position) 2023-2024

College/Dep.	MS.C	Ph.D	Total	Proff.	Ass. Prof.	Lec.	Ass. Lec	Total
New & Renewable Energy	14	12	20	1	6	14	5	26









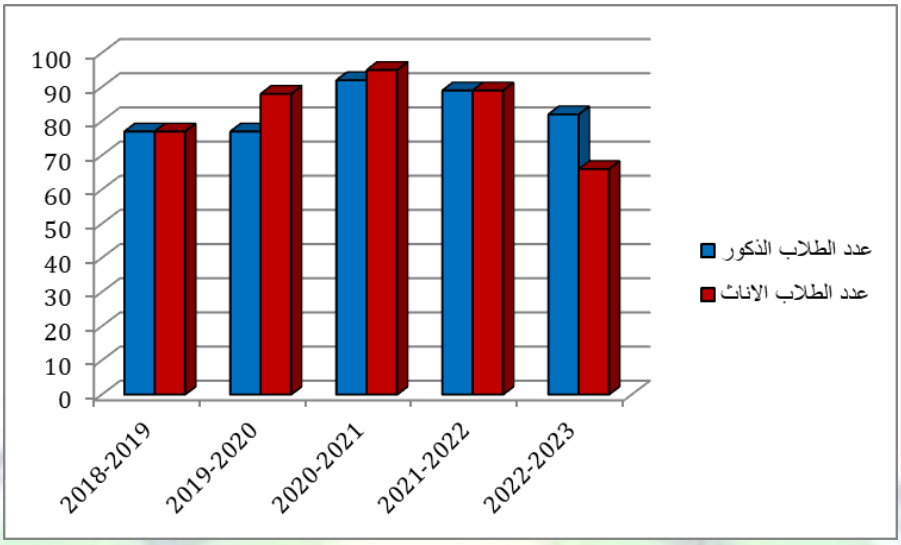
Ratio of doctoral degrees/total number of teaching staff × 8	٣,٤
Number of permanent teaching staff/total number of teaching staff × 8	٨

Ratio of students to teachers

Year	No. 1st class students	No. snd class students	No. 3rd class students	No. 4th class students	Total	The success rate	No. of Teacher's	No. of student/ No. of Teacher's
2018-2019	**48**	**36**	**33**	**35**	**152**	**100%**	**20**	**7.6**
2019-2020	**48**	**42**	**40**	**33**	**164**	**100%**	**21**	**7.8**
2020-2021	**57**	**46**	**45**	**40**	**188**	**100%**	**19**	**10**
2021-2022	**32**	**55**	**47**	**44**	**178**	**95.5**	**20**	**8.9**
2022-2023	**18**	**28**	**55**	**47**	**148**	**63.7**	**21**	**7.04**
2023-2024								

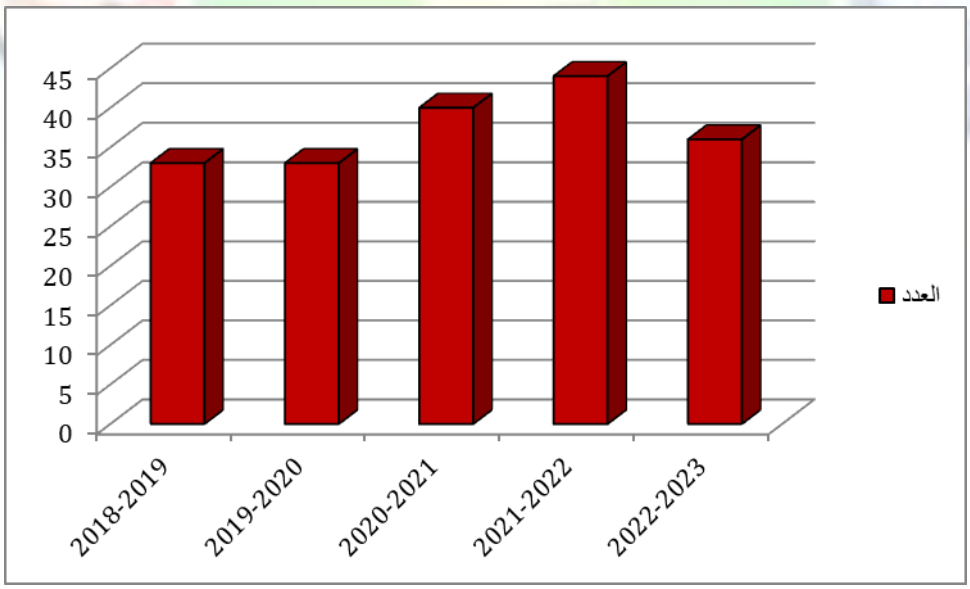
Number of students by gender for the past five years

Yaer	Number of Female students	Number of male students	Total
2018-2019	77	77	154
2019-2020	88	77	165
2020-2021	95	92	187
2021-2022	**89**	**89**	**178**
2022-2023	**66**	**82**	**148**
2023-2024	**50**	**63**	



Number of graduates for the past five years

Yaer	No.
2018-2019	**33**
2019-2020	**33**
2020-2021	**40**
2021-2022	**44**
2022-2023	**36**
2023-2024	



Summary of the most important achievements of QGU

Scope of Quality:

1- Writing and implementing boards related to the department's vision, mission, and goals.

2- Preparing questionnaires for students to evaluate the teaching.

3- Follow up on the implementation of the department's self-evaluation standards.

4- Participation in many seminars, workshops and conferences related to quality in Iraq.

5- Holding workshops aimed at improving quality in the department.

6- Holding and attending a scientific course on performance evaluation for department members.

7- Preparing posters and work maps before starting the department's self-evaluation process.

8- Work on periodically coding the new curricula and exam questions.

Scope of University Performance:

1- Completing the department's annual calendar file.

2- Conducting evaluations of faculty staff as well as evaluations of employees.

3- Archiving (automation) of information: electronic documentation of information in the Quality Assurance Division of the department.

The Academic Strategic Plan:

1. A plan for accepting students in the undergraduate studies stage .
2. A plan for accepting postgraduate students .
3. A plan of educational guidance and activity and preparing conferences, seminars, and exhibitions

Field and scientific trips:

The department works to create a state of interaction between the theoretical lectures given to students and practical reality, through visits and scientific trips to departments and laboratories related to the students' specialization in renewable energies, such as the Mosul Dam, to learn about the mechanism of converting water energy into electrical energy, and to the meteorological department in order to understand the structure of The atmosphere, the distinction between weather and climate, learning how to measure wind speed, and also visiting waste recycling and sorting plants to learn how to benefit from waste and convert it into useful energy.

Titles of some of the activities conducted in the department

Workshops and continuing education courses

The department has completed many workshops and continuing education courses related to renewable energies and various scientific topics.

Table of workshops and continuing education courses for the New and Renewable Energies Department for the academic year 202-2023

No.	Title of the activity	Data
1	Administrative and financial corruption in Iraq	٢٠٢٣/١٠/١٥
2	Fuel cells in renewable energy applications	٢٠٢٣/١٠/٢٥
3	The new House of Representatives and Provincial Councils Elections Law	٢٠٢٣/١1/١
4	Pharmaceutical fraud and its danger to the patient's life	٢٠٢٣/١١/٨

5	Modeling and simulation of a hydrogen energy storage system	٢٠٢٣/١١/١٥
6	Renewable energy and sustainable development	٢٠٢٣/١١/٢١
7	Estimation of elements and compounds using different analytical methods	/٣٠,٢٩ ,٢٨ ٢٠٢٣/١١
8	The legislative institution in the United States of America (Congress)	٢٠٢٣/١٢/٦
9	Global warming and climate change	٢٠٢٣/١٢/١٣
10	Analytical chemistry and drugs	٢٠٢٤/١/٣١
11	The art of leadership	٢٠٢٤/٢/٧
12	Biomass is the ideal solution to reduce greenhouse gas emissions	٢٠٢٤/٢/١٤
13	Safe handling of chemicals	٢٠٢٤/٢/٢٨
14	Heavy elements, their impact on the environment and analytical methods for their estimation	٢٠٢٤/٣/٧,٦,٥
15	United Nations structure	٢٠٢٤/٣/١٣
16	Thermal insulation of buildings in order to save energy	٢٠٢٤/٣/٢٧
17	Analytical treatments of biomass and its role in supporting sustainable development	٢٠٢٤/٤/٨
18	Feminist theory in international relations	٢٠٢٤/٤/١٧
19	Studying methods of using solar energy to confront climate change	٢٠٢٤/٤/٢٤
20	Analytical chemistry and drugs	٢٠٢٤/٤/٣٠

The Patent:

No.	Patent title	Names of participants in the patent	No. of Patent	Date obtained
1	A method for producing standard surfacing materials by catalytic thermal treatment of heavy bituminous materials with sulfur	Prof. Dr. Imad Abdulqader Aldobouni Lubna Abdulaziz Salih Ghandi ghanim Aziz	2726	30/7/1998
2	Molecular Reform of Hydrocarbonic Liquid by Microwaves	Anwar M. Al_Faydhi Hazim S. Al_Hadidi	3703	28/11/2013
3	Developed a new asphalt binder consisting of a thermodynamically stable asphalt-sulfur mixture	Dr. Lubna Abdulaziz Salih Prof. Dr. Imad Abdulqader Aldobouni Marwa Hassan Altamer	4098	22/12/2014
4	A method to increase the liquid yield of biofuels and reduce the minimum thermal limits of thermal cracking of chemical to lingo cellulosic biomass by pre-treatment	Imad A. Aldobouni Hamid A. Salih Abdulrahman A. Sulaima	6164	6/2/2020
5	Manufacture of a nanodiode from (Si-CNT junction) by plasma sputtering for the first time without a catalyst.	Prof. Dr. Bassam Mahmoud Mustafa Dr. Mohammad Mahmood Uonis Prof.Dr. Anwar Mustafa Al-Faydi	6301	26/8/2020
6	Manufacture of heat insulators from scraps of tires rubber with papers and poly (ethylene terephthalate)	Asaad Faisal Khattab Omran Sara Khalid Saeed Mohammed Hamzah Dahham	7892	1/3/2023
7	Iraqi technology for the typical production of continuous casting nozzles for iron smelter	Corkis Abdul Ali Adam Aoun was greeted by Aliwi	2007	29/11/2001

		Muhammad Ali Jaber Hamed Abdullah Saleh Muhammad Mukhayt Marri Abdul Ali Hassan		
8	Iraqi technology for the production of thermal mortar for the purposes of packaging iron fuse crucibles.	Corkis Abdul Ali Adam Aoun was greeted by Aliwi Muhammad Ali Jaber Hamed Abdullah Saleh Muhammad Mukhayt Marri Abdul Ali Hassan	2006	28/11/2001

Department activities on the website

Title	English web site	Arabic web site
Dep. in Brief	https://rb.gy/bkq3u8	https://rb.gy/xxhruq
Web Site of Dep.	https://rb.gy/d3hxnp	https://rb.gy/ohfsfu
Vision, Mission & Objectives	https://rb.gy/5fqxz6	https://rb.gy/ie36zh
Description of Academic Program	https://rb.gy/60dgxm	https://rb.gy/a5gb33
Boloing process	https://rb.gy/wh7akg	https://rb.gy/rmzg4y
Curricula Description	https://rb.gy/fzjjeu	https://rb.gy/76z3f0
Subjects & Study Units	https://rb.gy/mqp0eq	https://rb.gy/m74co5
Educating Goals		https://rb.gy/xr4evc
Lectures	https://rb.gy/6d0dnd	https://rb.gy/joxf5k
Education-related Links	https://rb.gy/5p44jt	https://rb.gy/2yetp8
Projects of Students Graduation	https://rb.gy/wtqpzc	https://rb.gy/cssxuw
Teaching Staffs CV	https://rb.gy/i3fzp2	https://rb.gy/0z3azm

Laboratories of Dep.		https://rb.gy/ve15cv
Important Links	https://rb.gy/6h3u7v	https://rb.gy/o2mbxn
Published Research	https://rb.gy/vzks7r	https://rb.gy/3jpmta
Graduation Outcomes	https://rb.gy/eml15a	https://rb.gy/ttib8h
Self-assessment Report	https://rb.gy/l0ibaf	https://rb.gy/eagl7i
Research Directions	https://rb.gy/sf2oh5	https://rb.gy/dbf2tw
Links of Education for Teachers	https://rb.gy/vbzcmy	https://rb.gy/p1j9yi
Citizens Affair		https://rb.gy/bsi0ec

Chapter II

ABET Accreditation Program Standards

ABET standards:

With regard to academic programs, our college has chosen the ABET program for academic accreditation, and proactive plans have been made to work within this program, under the direct supervision of the Dean of the College and his scientific and administrative assistants, by holding an introductory workshop on the ABET program.

About accreditation:

The Accreditation Board for Engineering and Technology (ABET) is an American non-governmental organization that grants accreditation to academic programs in colleges and universities around the world in the fields of applied sciences, computers, engineering, and technology. It is one of the most trusted academic accreditations in the United States of America. ABET has been providing accreditation certificates to confirm the quality of academic programs in university studies for more than 75 years.

What does ABET accreditation mean:

ABET accreditation is confirmation that the academic program obtained applies the standards of educational quality agreed upon by those with relevant experience in education to prepare and qualify students. Learning specifications are set in terms of the academic program's mission, learning objectives, learning outcomes, and study plan for engineering programs by experts in engineering education, with confirmation of the existence of mechanisms to ensure that feedback is taken from all its sources and used for continuous improvement of the academic program so that graduates of these programs continue to have the highest specifications, qualifications, and skills they need. The labor market and to ensure

that the graduate remains capable of continuous self-learning that enables him to keep pace with developments in his field.

The importance of ABET accreditation:

- ABET accreditation ensures confidence that the academic program has met the basic standards to prepare graduates to enter the fields of science, technology, engineering, and mathematics, which have become a requirement for the global labor market.
- Graduates from an ABET-accredited program have a strong and capable educational foundation that enables them to follow the path of rapid technological innovations and developments.
- Accreditation helps students and their parents choose a reliable specialization, as it guarantees students that their educational experience keeps pace with international standards for learning and technical education in the vocational field.
- Accreditation gives companies and employers the opportunity to select and employ graduates, knowing that these graduates have been taught the specialty within international standards.
- Enhances job opportunities for the graduate as multinational companies require graduation from an accredited program.
- Registrars, licensors and certificates may use the accreditation to select applicants for these licenses and certificates.
- Accreditation helps universities and departments establish an organized mechanism to evaluate and develop the quality of their programs.

Standards of the American Accreditation Authority:

The study aimed to evaluate the current situation of the department, and the extent to which the department achieves the standards to ensure quality, noting that the department, from the beginning, reviewed the experiences of regional and local universities and reached the following fact: The department needs support for a quality management system to ensure continuity of development and improvement of performance, and this in turn requires development and modernization in The management method and its work mechanisms are consistent with international standards for the quality of higher education and achieve compliance with the standards set by the Ministry of Higher Education and Scientific Research/the Scientific Supervision and Evaluation Agency/the Department of Quality Assurance and Academic Accreditation by adopting the program standards.

Academic accreditation standards for: ABET

This report has been organized into several main axes:

- **The first axis:** Students, which includes student matters and everything related to students, including education, training, activities, admission and graduation mechanisms, and others.
- **The second axis:** Objectives of the academic program, educational objectives of the programs, and addresses the department's strategy, objectives, and ways to improve the educational process.
- **The third axis:** program outcomes
- **Fourth axis:** continuous improvement of quality.
- **The fifth axis:** curricula and everything related to study hours, updating, and transfer during the four years.
- **The sixth axis:** The teaching staff, which includes matters related to the teaching staff in the department and ways to improve them in order to develop the educational process in the department.
- **Seventh axis:** capabilities and infrastructure of the department.
- **The eighth axis:** institutional support.

1st Axis: students

Axis: students

1- Student registration and admission mechanism:

The student is accepted into the department centrally by distributing the student by the Ministry to various colleges and institutes, where the student who graduates from preparatory school in the biological and applied branches fills out the admission form through which he is accepted, based on the sequence of his choices and his average. The number of students applying and the minimum averages. Students applying to the college are accepted in general on the basis of the scientific departments, of which the Department of New and Renewable Energies is one of them. Students are distributed among these departments depending on their desires, which are confirmed by filling out a selections form. Internally, as well as on their grades in preparatory school, according to the total.

The capacity of the New and Renewable Energies Department is determined within the admission plan sent to the deanship, then to the university, and then to the ministry to obtain official approvals.

Application to the college is made through the Registration Division of the Deanship of the College of Science, taking the required official documents, and distributing the students to the college's departments according to the capacity and the student's desire in terms of allowing him to move from the highest department to the lowest department in the hierarchy of departments in the College of Science.

2- Central guidance

The Central Guidance Committee seeks to establish mechanisms to maintain the student's needs during the university stage by providing the necessary and appropriate environment to enable the student to succeed and achieve academic excellence, in addition to enhancing confidence in his abilities, especially in the field of his future work. Secondly, identifying the problems or obstacles that may

cause a negative impact on his studies and the urgent mechanisms to work to overcome the problems that the student may encounter in the scientific, personal and psychological aspects. The most important thing you can do in the field of developing the student's personality is Strengthening cooperation between the student and the professor in the field of scientific knowledge, and allowing the student to resort to the advisor and the college in the event of a problem or topic that is difficult to solve, and referring to guidance as an important means of confidence and personality for the student, and there are four professors supervising each. Stage in the department.

3- Methods used in evaluating students and graduation requirements:

Our department's program awards a bachelor's degree in renewable energy sciences. In order for the student to obtain the certificate granted by the program, he must meet the following requirements:

- Passing the four academic stages through:

  First: Attending attendance hours for each subject is not less than (90%) of the hours scheduled for the subject

  Second: Obtaining a passing grade in each subject for the year in question, which is equal to 50%. The grade for each subject is determined based on the evaluation method used.

- In addition to continuous monitoring of the student's attendance at theoretical and practical lectures, the student is considered not to have completed the subject if his hours of absence exceed 10% of the total hours for that subject.
- After completing the above certificate requirements, the student will be granted a bachelor's degree in renewable energy sciences.
- Summer training: The student must pass the summer training period in one of the state departments related to his specialization, which can develop his skills so that he can be directly exposed to practical life. This should be done during the summer vacation after success in the third stage.

- Graduation project: It is one of the requirements for granting a bachelor's degree in renewable energy sciences, as the student must complete the research and pass the discussion in the fourth stage.

Guidance and advice for students:

Advice and guidance are provided to students by guidance committees. Teachers follow up on students through guidance committees in the department, and an educational guidance program has been developed in the New and Renewable Energies Department for the four stages, to identify students' problems and contribute to solving them.

Alumni Description:

The student who graduated from the Department of New and Renewable Energies can be described as follows:

1- He is the person who completed his academic studies in the sciences of new energies and obtained a bachelor's degree/in science/sciences of new energies. Who possesses detailed and accurate specialized information in his science such that this information enables him to work in one of the jobs or centers that qualifies him to work in this aspect of applied sciences.

2- He is the one who has gained from his studies extensive experience and scientific and technical information that has applications in the field of energy, environment, and electricity, such that this information enables him to work and practice a profession related to his specialty with complete success.

The alumni's field of work	Description Certificate	Department	College	University
Departments or institutions of the Ministry of Higher Education and Scientific Research, Ministry of Electricity, Ministry of Environment, Ministry of Health, Ministry of Defense, Ministry of Industry and Minerals	Bachelor's New and Renewable Energies	New and Renewable Energies	Sciences	Mosul

Numbers of under graduate students:

Table (1): Numbers of under graduate students 2020-2021:

Stage	Male	Females	The Number	Average age
One	21	14	35	18-24
Two	22	24	46	19-31
Three	14	30	44	20-30
Four	22	18	40	21-28

Table (2): Numbers of under graduate students 2021-2022:

Stage	Male	Females	The Number	Average age
One	20	13	33	18-24
Two	29	26	55	19-31
Three	24	23	47	20-30
Four	16	28	44	21-28

Table (3): Numbers of under graduate students 2022-2023:

Stage	Male	Females	Number	Average age
One	9	7	16	18-24
Two	16	12	28	19-31
Three	30	25	55	20-30
Four	25	22	47	21-28

Table (4): Numbers of under graduate students 2023-2024:

Stage	Male	Females	The Number	Average age
One	2	4	6	18-24
Two	7	6	13	19-31
Three	28	15	43	20-30
Four	26	25	51	21-28

Table (5): Number of students by gender for the past five years

Year	Females	Male	Total
٢٠١٩_٢٠١٨	٧٧	٧٧	١٥٤
٢٠٢٠_٢٠١٩	٨٨	٧٧	١٦٥
٢٠٢١_٢٠٢٠	٩٥	٩٢	١٨٧
٢٠٢٢_٢٠٢١	89	89	178
٢٠٢٣_٢٠٢٢	66	82	148
2024-2023	51	63	114

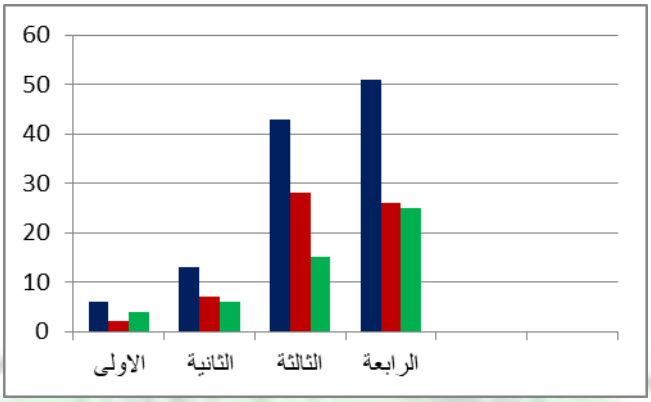
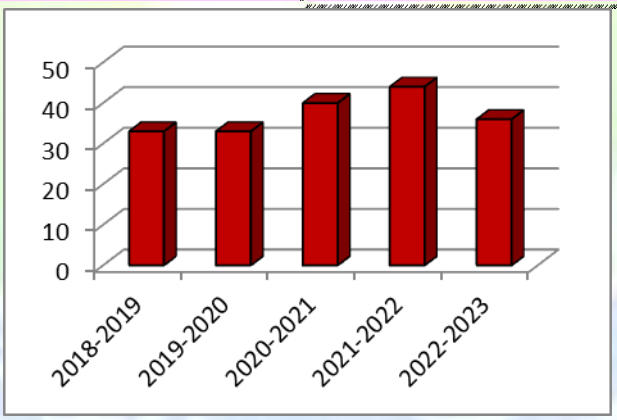


Table (6): Number of graduates for the past five years

Year	No.
٢٠١٨-٢٠١٩	٣٣
٢٠١٩-٢٠٢٠	٣٣
٢٠٢٠-٢٠٢١	٤٠
٢٠٢١-٢٠٢٢	٤٤
٢٠٢٢-٢٠٢٣	٣٦



2nd Axis: Objectives of the academic program

Objectives of the academic program

Educational objectives of the program:

1.Graduating students familiar with scientific and practical information in the three branches of New and Renewable Energies - microNew and Renewable Energies , zoology, and botany, and developing the student's personality to develop it into a scientific personality capable of understanding and diagnosing scientific problems in society and dealing with them with wisdom and science starting from his scientific stock, and guiding the student educationally during The academic stage and developing the spirit of cooperation for teamwork.

2. Developing the teaching staff, as teachers are sent to study outside the country through scholarships, fellowships, and development courses in reputable international universities, and openness to international educational institutions such as universities and international research centers, and try to benefit from the capabilities and expertise of these institutions. In addition to opening channels of communication with Iraqi colleges and universities and participating in conferences, scientific seminars, and continuing education courses within the country.

3. Curriculum development.

Components of the academic program:

The components of the program are those who must be satisfied with the performance according to the New and Renewable Energies program, and they are:

1. Faculty: Faculty participates on a regular basis in the evaluation of the academic program. Faculty members are a homogeneous group who work as a team to improve education in the department. Most of the faculty members participate in research.

2. Students: Students are interested in whether the program adequately prepares them for future employment. Students in the program are motivated to become

successful researchers who are well-versed in their field to suit their expected future work.

3. Graduates: This group consists of recent graduates and graduates who have been working for 3 to 5 years. Graduates with 3 to 5 years of work experience form an essential part of the evaluation process. They must have incentives to evaluate the quality of the academic program based on their professional achievements.

4. Employers: (Government, industry, universities): Employers' satisfaction with the educational level of our students provides a measure of the program's success. Their satisfaction translates into job opportunities for our students.

The process of setting educational program objectives:

The mission of the university, college, and department is to instill in its graduates a solid scientific foundation for the specialty in question, scientific knowledge, and the development of intellectual skills necessary for excellence in their professional lives.

Emphasis is placed on encouraging faculty members to publish their scientific research in international and Iraqi journals.

Achieving the program's educational objectives:

The assessment of the objectives of the New and Renewable Energies academic program is checked continuously and periodically through many channels such as employers, student debriefing process, faculty opinions, etc.

3rd Axis: program outcomes

Program outcomes:

The results of the program are listed below, as the graduating student has successfully acquired all the skills, knowledge, and behaviors found in the results listed below to achieve the program objectives. On this basis or descriptive concept, the New and Renewed Energies graduate must have the following knowledge:

- Able to engage in the labor market in the field of renewable energy systems, intending to provide the market with what it needs of human cadres specialized in this field with an academic level and technical capabilities that enable them to deal with various problems in the energy sector and serve the community.
- Providing the student with life skills for the labor market due to the distinction of the specialization in its combination of traditional energy systems and renewable energy systems in generating electrical energy through solar panels and wind turbines, in line with the global trend for clean energy and reducing environmental pollution.

4th Axis: continuous improvement

Review program outcomes and student goals:

The Department of New and Renewable Energies at the University of Mosul offers a program leading to a Bachelor of Science degree in New and Renewable Energies.

The program outcomes are reviewed annually with faculty members and relevant committees in the department. To support the program, the department plans to visit various offices and institutions as well as private sector companies to find out their opinions about the department's graduates and their suggestions for improving the program.

Student opinion statement and continuous improvement process:

A questionnaire form is distributed to the department's students at all levels of study at the end of the academic year for the purpose of determining the accuracy of the department's teaching performance. It consists of 36 items as follows:

Paragraphs	Acceptable	Middle	Good	Very Good	Excellence
It takes into account individual differences and psychological characteristics of students.					
Discusses students' answers and inquiries flexibly and accepts other points of view.					
Develops good attitudes, habits and morals in students.					
He uses a variety of educational methods to motivate students.					

It provides cooperative or competitive activities in which students interact with each other.					
His ability to manage time for lectures and adhere to appointments.					
Motivate students to review the references of various scientific subjects.					
Students feel concerned for them and want to benefit them.					
Diversify the questions and take into account the correct timing when asking them during the lecture.					
It addresses students' weaknesses in the academic subject and enhances their strengths.					
He adheres to the specified time for the lecture, attends and leaves, and uses his time well.					
He speaks in a clear voice and understandable language.					
His commitment to scientific aspects during the lecture and not addressing external matters that are not related to the topic of the lecture.					
Diversifying interesting teaching methods and using more than one teaching method during the lecture.					
It provides students with the vocabulary included in the curriculum and its basic sources.					
Distributes the subject matter according to an appropriate timetable known to the students.					
Gradual presentation of scientific material from simple to complex.					
He is good at answering students' questions.					
He focuses on educational guidance whenever the opportunity allows.					
It depends on dialogue and discussion.					
He asks evaluative questions during the lecture and at its conclusion that illuminate the students' creative thinking and measure their understanding of the material.					

It uses oral and written methods and tests.					
Explains how grades are distributed on activities and tests at the beginning of the semester.					
The results of periodic examinations and written work are announced in a timely manner.					
It attracts students' attention throughout the lecture in multiple ways.					
Encourages everyone to actively participate in the lecture.					
Encourages students to use resources and benefit from the library and the Internet.					
Directs the student on ways to avoid academic plagiarism.					
It enables the student to use methods of writing and publishing scientific research in reputable journals.					
He has good relationships with his students.					
Directs the student to use resource arrangement programs in research.					
He welcomes questions from his students outside lecture hours.					
It encourages cooperative work such as (ceremonies, competitions, matches, exhibitions, etc.).					
He conducts live broadcast lectures.					
He publishes video lectures in electronic classes.					
He publishes lectures in the form of PowerPoint slides in electronic classes.					
the total					
percentage					

The following figures (1,2,) represents the statistical analysis of a sample of the results of a student opinion questionnaire about one of the teachers for the year 2020-2021 and 2021-2022 respectively.

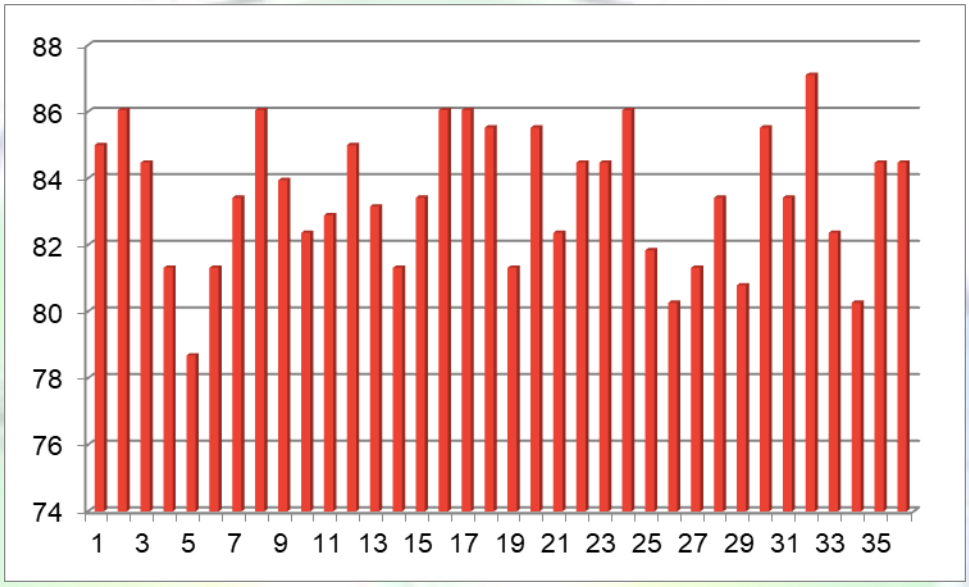


Figure (1) Statistical analysis of a sample of the results of a student opinion questionnaire about a teacher for the year 2020-2021

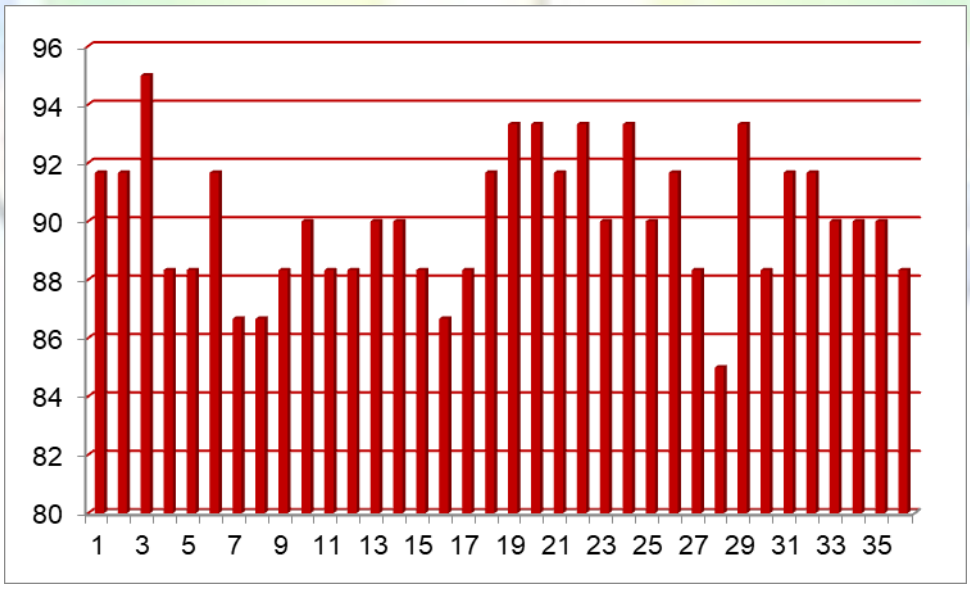


Figure (2) Statistical analysis of a sample of the results of a student opinion questionnaire about a teacher for the year 2021-2022

In the years that followed, the electronic ministerial form below was circulated:

	Paragraph	Excellence	Very Good	Good	Middle	Acceptable
١	He prepares the lesson and takes into account the sequence in presenting the material in a logical and interesting way					
٢	Diversify the different teaching methods and methods within the lecture					
٣	Improves methods of dealing with students and takes into account individual differences					
٤	Encourages and develops self-learning among students					
٥	He invests time within the lecturer to enrich the scientific material					
٦	uses various traditional and electronic methods in testing and evaluation					
٧	provides various cooperative or competitive activities to stimulate students' motivation					
٨	He monitors the level of students on an ongoing basis for the purpose of enhancing their strengths And address their weaknesses					
٩	Discusses students' answers and responds to their inquiries flexibly to create a safe learning environment					
١٠	Develops good attitudes, habits and morals among students					

The following figures (3,4) represents the statistical analysis of a sample of the results of a student opinion questionnaire about one of the teachers for the year 2022-2023 and 2023-2024 respectively.

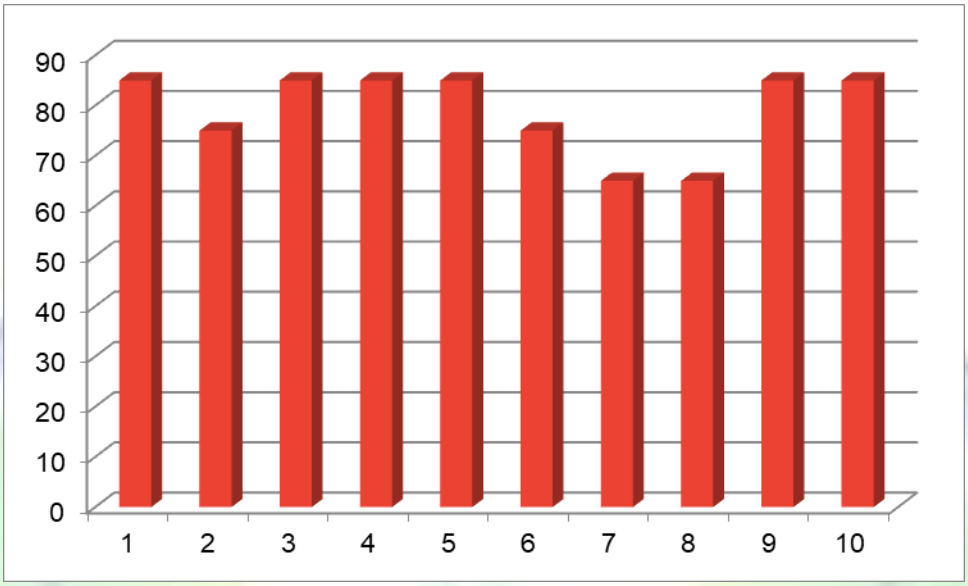


Figure (3) Statistical analysis of a sample of the results of a student opinion questionnaire about a teacher for the year 2022-2023

At the end of the academic year, statistics are also evaluated, which will be considered an indicator of the level of students' progress or not during the educational program and evidence of the level of teaching performance, his ability to deliver the scientific material to the student, and the accuracy of his dealings with students. The statistical results also indicate to us the deficiencies in the academic subjects that the student suffers from.

5th Axis: Syllabus

Syllabus

Programs of Studies in the Department:

Syllabus:

University name: University of Mosul

College/Institute: College of Science

Scientific Department: Life Sciences Department

Name of the academic or professional program: Bachelor's degree

Name of final degree: Bachelor's degree in Sciences of New and Renewable Energies.

Academic system: semester

Description preparation date: 2024

Date of filling the file: 2024

1. Program Vision

Studying the types of new and renewable energies and preparing a generation that is aware of the culture of renewable energy and is ready to use it as the basis for most of the energy in society, by providing an academic program and supplying society with distinguished graduates capable of dealing with the modern changes and developments taking place in the world and contributing to the development of scientific, health, industrial and environmental institutions in solving the problems that arise. Obstructs her progress.

2. Program Mission

The Department of New and Renewable Energies sought to create a generation capable of keeping pace with progress and development in basic sciences and their various applications and exploiting nature to produce green energy through:

Preparing cadres specialized in energy sciences and their applications and qualifying graduates specialized in the fields of energy and familiarity with the theoretical foundations of energy sciences and their field applications to work in scientific, research, educational, and industrial centers.

Providing students with educational skills by studying renewable energies of various types.

Increasing community knowledge of the benefits of renewable energy.

Deepening national loyalty and preserving the principles of society and noble human values.

3. Program Objectives

The department aims to introduce students to the types of green and clean energies

that are an alternative to traditional energy. These energies include solar energy, wind energy, biomass energy, hydropower, and geothermal energy. It seeks to achieve the following goals to reach the national classification:

First: General objectives:

a. Keeping pace with global development in all scientific fields related to energy and renewable energies.

B. Providing society and state institutions with scientific and technical expertise in the field of energy sciences and renewable energies and developing its scientific, health, and environmental institutions.

C. Raising the level of performance and quality to the ranks of advanced international universities.

Second: Educational objectives:

a. Developing and updating theoretical and practical scientific curricula.

b. Developing the academic competencies and performance of teachers and students.

Third: Objectives of scientific research:

a. Finding alternatives to traditional energies and replacing them with clean energy.

b. Investing in energy research and sustainable development to develop scientific, health, industrial, and environmental institutions.

c. Working to address energy-related problems in Iraq and finding appropriate solutions to obtain green energy at the lowest costs.

Fourth: Objectives of community service:

a. Supporting community activities by holding seminars, workshops, and scientific courses related to energy and renewable energies.

b. Expanding general horizons related to the importance of energy and

renewable energies in solving many health's, environmental, and industrial problems for the advancement of society.

Fifth: Objectives of student activity:

Ability to work in a multidisciplinary team.

Supporting student, cultural, social, sporting, and artistic activities.

Knowledge, cultural, and scientific exchange with other local and international universities.

Holding a scientific conference for graduation projects and honoring the distinguished ones.

Ability to communicate constructively.

4. Program Accreditation

Accredited until now is ABET

We are waiting for the ministerial accreditation standards that will be depended on soon.

5. Other external influences

Waiting for the ministerial accreditation standards

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	٥	١1	4.6	
College Requirements	١	2	0.8	
Department Requirements	٤٢	227	94.6	
Summer Training				The summer training will be requested from the student at the end of the sixth semester
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Republic of Iraq - Ministry of Higher Education and Scientific Research
University of Mosul
Bachelor's degree in New and Renewable Energies (First cycle)
Four years nine semesters) - 240 ECTS credits - 1 ECTS = 25 hr
Program Curriculum (2023 - 2024)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة الموصل
بكالوريوس علوم في الطاقات الجديدة والمتجددة (الدورة الأولى)
أربع سنوات تسع فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة
المنهاج الدراسي للعام ٢٠٢٣-٢٠٢٤

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGI	One	1	NRE1101	General Physics I	فيزياء عامة ١	English	3		2		1		3	93	82	175	7.00	C	
		2	NRE1102	Principle of Energies and their Sources	مبادئ الطاقات ومصادرها	English	3				2		3	78	72	150	6.00	C	
		3	NRE1103	General Chemistry	كيمياء عامة	English	3		2		1		3	93	82	175	7.00	C	
		4	NRE1104	Environmental Pollution	تلوث بيئي	English	3				2		3	78	72	150	6.00	C	
		5	UOM101	Arabic Language	اللغة العربية	Arabic	2						3	33	17	50	2.00	B	
		6	UOM104	Human Rights and Democracy	حقوق الانسان والديمقراطية	Arabic	2						3	33	17	50	2.00	B	
							16	0	4	0	6	0	18	408	342	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGI	Two	1	NRE1205	Fundamental of Electricity	اساسيات الكهربائية	English	3		3		1		3	108	92	200	8.00	C	
		2	NRE1206	Analytical Chemistry	كيمياء تحليلية	English	3		2		1		3	93	82	175	7.00	C	
		3	NRE1207	General Physics II (Optics)	فيزياء عامة ٢ (بصريات)	English	3		3		1		3	108	92	200	8.00	C	
		4	Sci-101	Mathematics	الرياضيات	English	2						3	33	17	50	2.00	B	
		5	UOM102	English Language	اللغة الانكليزية	English	2						3	33	17	50	2.00	B	
		6	UOM103	Fundamental of Computer Science	مبادئ علم الحاسوب	English	1		2				3	48	27	75	3.00	B	
							14	0	10	0	3	0	18	423	327	750	30		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGII	Three	1	NRE2308	Analog Electronics	الكترونيك التماثلية	English	3		2		1		3	93	82	175	7.00	C	
		2	NRE2309	Circuit Analysis	دوائر كهرباء	English	3		2		1		3	93	82	175	7.00	C	
		3	NRE23010	Inorganic Chemistry	كيمياء لا عضوية	English	2						3	33	42	75	3.00	C	
		4	NRE23011	Geology	علم الأرض	English	2		2		1		3	78	72	150	6.00	C	
		5	NRE23012	Thermodynamics	ديناميك حرارة	English	2		2				3	63	62	125	5.00	C	
		6	UOM201	Crimes of the defunct Baath Party	جرائم حزب البعث البائد	Arabic	2						3	33	17	50	2.00	B	
							14	0	8	0	3	0	18	393	357	750	30		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGII	Four	1	NRE24013	Digital Electronics	الكترونيات رقمية	English	3		2		1		3	93	82	175	7.00	C	
		2	NRE24014	Materials Science and Fluids	علم المواد والموائع	English	3		2		1		3	93	82	175	7.00	C	
		3	NRE24015	Computer Programming	برمجة حاسوب	English	2		2				3	63	62	125	5.00	C	
		4	NRE24016	Organic Chemistry	كيمياء عضوية	English	3		2		1		3	93	82	175	7.00	C	
		5	NRE24017	Occupational Safety	السلامة المهنية	English	2						3	33	17	50	2.00	C	
		6	NRE24018	Statistics	احصاء	English	2						3	33	17	50	2.00	C	
							15	0	8	0	3	0	18	408	342	750	30		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIII	Five	1	NRE35019	Measurements and Control	قياسات وسيطرة	English	3		2		1		3	93	82	175	7.00	C	
		2	NRE35020	Heat Transfer	انتقال الحرارة	English	3						3	48	27	75	3.00	C	
		3	NRE35021	Solar Energy	الطاقة الشمسية	English	3						3	48	27	75	3.00	C	
		4	NRE35022	Energy Transmission and Storage	خزن ونقل الطاقة	English	3		2		1		3	93	82	175	7.00	C	
		5	NRE35023	Modeling of Renewable Energy	نمذجة طاقات متجددة	English	3		2		1		3	93	82	175	7.00	C	
		6	NRE35024	Hydro Electric Energy	طاقة كهرومائية	English	3						3	48	27	75	3.00	C	
							18	0	6	0	3	0	18	423	327	750	30		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIII	Six	1	NRE36025	Solar Cell PV	خلايا شمسية	English	3		2		1		3	93	82	175	7.00	C	
		2	NRE36026	Economics of Energy	اقتصاديات الطاقة	English	3						3	48	27	75	3.00	C	
		3	NRE36027	Wind Energy	طاقة رياح	English	3		2		1		3	93	82	175	7.00	C	
		4	NRE36028	Meteorology	علم الارصاد الجوية	English	3						3	48	27	75	3.00	C	
		5	NRE36029	Petroleum Energy	الطاقة البترولية	English	3		2		1		3	93	82	175	7.00	C	
		6	NRE36030	Geothermal Energy	الطاقة الجيوحرارية	English	3						3	48	27	75	3.00	C	
							18	0	6	0	3	0	18	423	327	750	30		

Summer Semest	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIV	Seven	1	NRE47031	Biomass Energy	طاقة الكتلة الحيوية	English	3		2		1		3	93	82	175	7.00	C	
		2	NRE47032	Hydrology	علم المياه	English	3				1		3	63	62	125	5.00	C	
		3	NRE47033	Small Solar Energy systems	منظومات الطاقة الشمسية الصغيرة	English	3		2		1		3	93	82	175	7.00	C	
		4	NRE47034	Nuclear Energy	طاقة نووية	English	3				1		3	63	87	150	6.00	C	
		5	NRE47035	Professional Ethics	اخلاقيات المهنية	Arabic	2						3	33	17	50	2.00	C	
		6	NRE47036	(Fuel and Hydrogen Cells)	(خلايا الوقود والهايدروجين)	English	3						3	48	27	75	3.00	C	
							17	0	4	0	4	0	18	393	357	750	30		

UGIV	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
	Eight	1	NRE48037	Nanotechnology	نانوتكنولوجي	English	3		2		1		3	93	107	200	8.00	C	
		2	NRE48038	Conductive Polymers	البوليمرات الموصلة	English	3						3	48	52	100	4.00	C	
		3	NRE48039	Large Solar Energy systems	منظومات الطاقة الشمسية الكبيرة	English	3		2		1		3	93	107	200	8.00	C	
		4	NRE48040	Grid Connected Systems	نظم الربط بالشبكة	English	3				1		3	63	62	125	5.00	C	
		5	NRE48041	Graduation Project	مشروع التخرج	English	2						3	33	17	50	2.00	C	
		6	NRE48042	(Tidal Energy)	(طاقة المد والجزر)	English	3						3	48	27	75	3.00	C	
							17	0	4	0	3	0	18	378	372	750	30		
						Total	129.0	0.0	50.0	0.0	28.0	0.0	144.0	3249.0	2751.0	6000.0	240.0	Must be 240 ECTS	

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor's degree

Structured SWL (hr/w) type			Module type			SWL:	Student Workload
	CL	Class Lecture		B	Basic learning activities		
	Lab	Laboratory		C	Core learning activity	SSWL:	Structured SWL
	Pr	Practical Training		S	Suport or related learning activity	USSWL:	Unstructured SWL
	Tut	Tutorial		E	Elective learning activity		
	Lect	Online lecture					
	Semn	Seminar					

Note: Columns O, Q and R are progrmaed, protected and should not be edited

8. Expected learning outcomes of the program	
Knowledge	
Learning Outcomes 1	A- Knowledge and understanding Upon completion of the program, the student will be able to A1- Devise and understand the work of renewable energy systems A2- Applying knowledge in the field of renewable energies and keeping pace with the prospects for their rapid and steady development A3- Understanding, defining, formulating, and finding solutions to the problems and dilemmas of the various renewable energy systems. A4- Knowing the economic cost calculation for all types of renewable energies.
Skills	
Learning Outcomes 2	B- Subject-specific skills B1- The ability to work in a multidisciplinary team B2- The ability to communicate constructively B3- Effective influence on society and the labor market B4- Apply the theoretical and practical knowledge the student has learned in the field of renewable energy.
Learning Outcomes 3	C- Thinking skills C1-- Developing thinking skills by formulating questions and assignments that develop the student's abilities and increase his self-confidence and full readiness to understand and solve questions related to the subject. C2- Discussion skills C3- Laboratory report writing skills C4- The ability to use modern methods, tools, and skills necessary for work in the field of renewable energy
Ethics	
Learning Outcomes 4	D1- Equip the student to link the applied aspect with theoretical knowledge
Learning Outcomes 5	D2- Understanding energy and renewable energy and its types

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in implementing the program in general.

1- The delivery strategy (lecture) to give the student a comprehensive vision of the subject matter

2- Discussion strategy to deepen the student's understanding of the studied material

3- Cooperative education strategy, which develops the student's individual and collective responsibility

4- E-learning strategies to improve the teaching process

5- Discovery education strategy, which gives the student an active role in discovering information, which helps him retain learning.

10. Evaluation methods

Implemented at all stages of the program in general.

1- Written exam

A- Multiple choice exam

B- True and false exam

T- Fill-in-the-blank exam

D- Short answer exam

2- Assignment

A- Homework

B- Discussions

T- Writing laboratory reports

D- Graduation project for the final stages

1. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof.	1	–			1	
Assist. Prof.	6	–			6	
Lec.	14	–			14	
Assist. Lec.	5	–			5	

Academic Degree							Source of Diploma		Total No.
Assistant lecturer	Lecturer		Assistant professors		Professors		Outside country	Inside country	
	MSc	PhD	MSc	PhD	MSc	PhD			
٥	٦	٧	٢	٥	-	١	٢	٢٤	٢٦

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

• Encouraging them to attend conferences, workshops, and seminars, participating in discussion circles, and urging them to publish in reputable magazines.

• Introducing them to the university, its development vision, its plan towards internationalization,

and its development programs.

• Helping them adapt practically and psychologically and alleviating anxiety that could hinder their participation and integration into university work and activities.

• The new faculty member's familiarity with the university's professional development programs so that he can play an active role in them.

• Providing the opportunity for the new faculty member to build a network of relationships and communicate with his peers from other departments and colleges.

• Make him aware of their rights and duties.

• Introducing them to scientific research programs at the university to enable them to contribute to its research processes.

• Introducing them to the services provided by the university to its members so that they can benefit from them.

• Developing their skills in teaching, learning, and managing the educational process.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

• Continuous training: Continuous training opportunities must be provided for teachers and faculty members to improve their teaching, communication and technical skills. Workshops, training courses, seminars and conferences can be organized to provide these opportunities.

• Individual mentoring: Teachers and faculty should receive individual mentoring from experts in the field of higher education to improve their skills and develop their teaching methods.

• Communication and Collaboration: Teachers and faculty should be encouraged to communicate and collaborate with each other. Working sessions and forums can be organized to discuss ideas and exchange experiences and successful experiences.

• Continuous evaluation: Mechanisms must be provided to evaluate the performance of teachers and faculty members on a regular basis. Student surveys, peer feedback, and performance reviews can be used to evaluate performance and identify areas for improvement.

• Research and development: Teachers and faculty members should be encouraged to research and develop in their specialized fields. The necessary financial, technical and library resources can be provided to support research and publish results in scientific journals.

• Use of technology: Teachers and faculty should be encouraged to use technology in teaching and

communicating with students. Training and support can be provided to use available technological tools such as electronic learning management systems and interactive educational software.

• Community outreach: Teachers and faculty should be encouraged to connect with the local community and industry to provide opportunities for hands-on learning and practical application of the skills they acquire. Field visits and cooperation with companies and other institutions can be organized to achieve this.

2. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

1- Iraqi nationality.

2- Holder of a secondary school certificate supported by certification from the General Directorate of Education in the governorate.

3- Success in the medical examination according to the conditions specific to each study.

4- The age of the applicant for central admission must not exceed 24 years, i.e. those born in 2000 or above. Anyone older than that has the right to apply to evening or private colleges.

5- Acceptance according to the cumulative assessment.

6- Admission to departments is based on the student's cumulative GPA.

7- Absorptive capacity

8- If he is devoted to studying, it is not permissible to combine his job with studying in colleges and morning institutes.

3. The most important sources of information about the program

State briefly the sources of information about the program.

1- Methodical and helpful books.

2- Books and reading resources in English and Arabic.

3- Additional sources from the Internet.

4- Training courses held by the university on e-learning platforms

4. Program Development Plan

• Organizing workshops and training courses.

• Forming committees to discuss the reality of teaching, with its positives and negatives, and to develop curricula and plans and update educational resources.

• Providing opportunities for academic and research development through participation in scientific seminars and conferences.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
First class	NRE1101	General Physics I	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE1102	Principle of Energies and their Sources	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE1103	General Chemistry	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE1104	Environmental Pollution	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	UOM101	Arabic Language	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	UOM104	Human Rights and Democracy	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE1205	Fundamental of Electricity	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE1206	Analytical Chemistry	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE1207	General Physics II (Optics)	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Sci-1105	Mathematics	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	UOM102	English Language	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	UOM103	Fundamental of Computer Science	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Second class	NRE2308	Analog Electronics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE2309	Circuit Analysis	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE23010	Inorganic Chemistry	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE23011	Geology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE23012	Thermodynamics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	UOM201	Crimes of the defunct Baath Party	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE24013	Digital Electronics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE24014	Materials Science and Fluids	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

	NRE24015	Computer Programming	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE24016	Organic Chemistry	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE24017	Occupational Safety	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE24018	Statistics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Third class	NRE35019	Measurements and Control	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE35020	Heat Transfer	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE35021	Solar Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE35022	Energy Transmission and Storage	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE35023	Modeling of Renewable Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE35024	Hydro Electric Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE36025	Solar Cell PV	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE36026	Economics of Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE36027	Wind Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE36028	Meteorology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE36029	Petroleum Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE36030	Geothermal Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Forth class	NRE47031	Biomass Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE47032	Hydrology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE47033	Small Solar Energy systems	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE47034	Nuclear Energy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE47035	Professional Ethics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE47036	Elective Course (Fuel and Hydrogen Cells)	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE48037	Nanotechnology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE48038	Conductive Polymers	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

	NRE48039	Large Solar Energy systems	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE48040	Grid Connected Systems	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE48041	Graduation Project	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	NRE48042	Elective Course (Tidal Energy)	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

Compatibility of the curriculum with the program's educational objectives:

The College has full authority to determine, review, implement, and achieve the program's educational objectives. The college's primary role is to establish, review, and evaluate program topics, set and review the program's educational objectives, and ensure student outcomes. Therefore, the above process ensures that the curriculum is aligned with the program's educational objectives as shown in the various tables. The Department of New and Renewable Energies ensures that students receive all scientific analyses within the context of the science program.

6th Axis: Teaching staff

Teaching Staff

Administrative regulation

The New and Renewable Energies Department Chair is responsible for all aspects of department management. The department has an administrative system with a clear structure in terms of responsibilities, and the administrative work in the department is distributed within an organizational structure. Note that the New and Renewable Energies Department's program is determined by the Department Council, which in turn sets the foundations and basics for the execution of the program since the beginning of the academic year while providing the opportunity for faculty members to contribute to making this policy through their participation in the various department committees, which in turn submit recommendations to the department's management for Take it into account when making decisions.

a. Description of faculty members in the New and Renewable Energies Department

The Department of New and Renewable Energies is distinguished by a teaching staff. The department includes 26 teachers, distributed according to their certificates and academic titles in the following table:

Description of faculty staff in the Department of New and Renewable Energies

Academic Degree							Source of Diploma		Total No.
Assistant lecturer	Lecturer		Assistant professors		Professors		Outside country	Inside country	
	MSc	PhD	MSc	PhD	MSc	PhD			
٥	٦	٧	٢	٥	-	١	٢	٢٤	٢٦

Name Of faculty staff in the Department of New and Renewable Energies

No.	Name	The scientific title
1	Alaa Ismail Ayoub Zidane	Professor
٢	Asim Ahmed Issa Muhammad Al-Abdali	Assistant Professor
3	Bashir Khalil Ahmed Hassan	Assistant Professor
4	Lubna Abdel Aziz Saleh	Assistant Professor
5	Lamia Adnan Najeeb Sarsam	Assistant Professor
٦	Hazem Saleh Ahmed Hilal Al-Hadidi	Assistant Professor
7	Thana Yacoub Youssef	Assistant Professor
8	Saad Fadel Mahmoud Jassim Al-Hayali	Teacher
9	Ghada Ghanem Younis Majeed Al-Taie	Teacher
10	Hamed Abdullah Saleh	Teacher
11	Ibtisam Yahya Abdullah	Teacher
١٢	Mead Salem Younis Thanoun Al-Hadidi	Teacher
13	Muhammad Mahmoud Younis Al Nuaimi	Teacher
14	Nagham Salem Muhammad	Teacher
١٥	Zahraa Badie Ibrahim Khalil Al-Dabbagh	Teacher
١٦	Rana Hisham Mahmoud Al-Abaji	Teacher
١٧	Hassan Yahya's prayer	Teacher
١٨	Zainab Walid Majed	Teacher
19	Maymouna Khaled Qasim	Teacher
20	Mustafa Hussein Ibrahim Mahmoud	Teacher

21	**Zakaria Abdel Wahed Hamid**	**assistant teacher**
22	**Sarah Khaled Saeed**	**assistant teac**
23	**Enas Abdel Qader Hassan Tawfiq**	**assistant teac**
24	**Hala Mounir Yahya Othman**	**assistant teac**
25	**Salah Afdo Ali Maho**	**assistant teac**
26	**Waheed Abdi Sheikho**	**assistant teac**

b. Administrators and support staff

No.	Name	Career title
١	Omar Muhammad Hamdi Abbawi	Senior physicist
٣	Saad Ismail Khalil	Asst. Engineer
٤	Noha Muhammad Essam	Asst. Chemistry
5	Bilal Ahmed Saleh	Head of Chemists

No.	Name	Career title
١	Bushra Muhammad Ibrahim Abdullah	Art Director
٢	Amra Hazem Ahmed	Senior master craftsman
٣	Intisar Hamoud Jassim	Senior master craftsman

7th Axis: The Department's Infrastructure

The Department's Infrastructure

Study buildings and laboratories

The department includes offices and annexes, including classrooms, administrative offices, and laboratories. The department owns a building for theoretical and practical teaching as follows:

Classrooms

There are 4 classrooms in the department that are qualified to receive students at the preliminary studies level and are equipped with most of the needs and illustrative means for giving lectures and scientific discussions.

Laboratories

The laboratories are shown in the following table:

Laboratories of New and Renewable Energies department

Name of laboratory	Devices No	Hours No. In work	Lab area m^2	Laboratory readiness%	Student NO.	Using lab (Undergraduate and Graduate)
Solar Cell lab	Board	3	40	50%		Undergraduate
Physics lab	0	3	70	0%		Undergraduate
Chemistry lab	0	3	60	20%		Undergraduate
Digital & Analog lab	30	3	60	80%		Undergraduate
Computer lab	12	3	40	50%		Undergraduate
Wind Energy lab	0	3	70	0%		Undergraduate

Library and references

The department owns a small library that includes various books from various publishing sources and Iraqi and Arab scientific journals. It consists of a reading room equipped with air conditioning and refrigeration equipment, as well as other reading supplies. The department plans to expand the library, whether in archiving books and sources or the reading room.

8th Axis: Institutional Support

Institutional Support

Supporting the educational institution in terms of financial resources and constructive leadership must be effective to ensure the sustainability and value of the program. Resources must be prepared to ensure the continuity and operation of all facilities and laboratory equipment related to the program, in addition to supporting the service-related items.

The Department of New and Renewable Energies is affiliated with the College of Science at the University of Mosul. The College of Science contains the Accounts Division, which manages financial affairs at the college level. Addition to support from international organizations and civil society organizations. However, these contributions constitute only a small portion of government allocations. Therefore, the main source of financial support for departments is from government allocations.

Government allocations to the department

The allocations included the provision of a fire system, laboratory equipment, and classroom chairs.

CHAPTER III

RESULTS AND ANALYSIS USING (SWOT) AND IMPROVEMENT PLAN

SWOT analysis system

SWOT analysis is known as the framework that is used to evaluate a company or institution, identifying its strengths and weaknesses, and identifying the opportunities and threats that may be exposed to it. It is also called the "SWOT matrix" or the "Quarter analysis tool." This analysis is not limited to projects only but rather includes several other fields such as marketing, human development, and business management. The emergence of this analysis goes back to experts at Stanford University, where this analysis was conducted between 1960 and 1970 under the supervision of Albert Humphrey, to identify the reasons for the failure of joint planning, the resulting economic problems, and how to address them.

The importance of SWOT analysis

SWOT analysis is responsible for helping projects improve their position in the market, as its importance stems from the fact that it works on:

1. Show strengths and exploit them to achieve project goals.
2. Show weaknesses, work to correct them, and benefit from them.
3. Explore good opportunities and benefit from them in developing the project.
4. Study potential threats to the project, and work to avoid them.
5. Develop alternative plans, supplementary plans, and emergency arrangements for the project.
6. Work on marketing strategies, so that they are creative and distinctive.
7. Prepare a risk management plan for the project.
8. It helps measure the project's performance compared to its competitors in the market.
9. Knowing and identifying tools that help develop project performance.

SWOT analysis is used in the strategic planning process, as it is an important tool for exploring opportunities for success and where threats are located.

SWOT Analysis Elements

SWOT analysis is an abbreviation of four words in the English language that represent the elements on which the analysis is based. These elements relate to the external and internal environment of the project, which are:

Strengths S

Weaknesses W

Opportunities O

Threats T

Results

The results of the self-evaluation study showed the extent to which the standards were met as follows.

Standard NO.	Standard name	Degree of conformity		
		Totally	Partially	NO
1	Students	✓		
٢	Objective of educational program	✓		
٣	Program outputs	✓		
٤	Continuous quality improvement		✓	
٥	Curriculums	✓		
٦	Teaching staff	✓		
٧	The capabilities and infrastructure of the department		✓	
٨	Institutional support		✓	

Analysis the outcomes by SWOT

1st Axis :Students

Students

Strength point

- There are multiple mechanisms to support students, whether at the level of guidance and rehabilitation or the level of academic performance as well
- About the existence of a system to support students financially.
- There is guidance and educational committees in the department that take it upon themselves to follow up on students, provide them with educational advice and guidance, and help them overcome the problems and difficulties they face.
- The department's sponsorship of artistic and sports activities
- Forming a department introduction committee that undertakes the task of introducing the department at the beginning of the academic year, especially to new students, explaining the department's goals and mission, descriptions of the graduate's work from the department, the department's curricula, and others.
- A survey of students' opinions in recent years regarding academic subjects, the level of exam questions, and the obstacles surrounding the teaching and learning process.

Weaknesses

- Students are accepted into the department at the lowest rates, which indicates the low academic level of students accepted into the department.
- Sometimes it happens that a student's acceptance into the department is not by his choice. Because of the rate.
- The weakness of the systematic training program, despite its importance, is due to the lack of seriousness of the training sites the weak follow-up by the

relevant committees, and the distance to these sites, as the student usually chooses the site close to his place of residence.

- The lack of a mechanism to activate relations between the corresponding departments and colleges on the Arab and international levels.
- Limited training and development courses for teaching and administrative staff.
- Limited opportunities to exchange experiences with external universities.

Opportunities:

- Interest in obtaining accreditation.
- Signing a memorandum of understanding with different universities.
- State institutions and the private sector in Iraq need researchers specialized in renewable energies.
- Several department members must contribute and benefit from agreements with corresponding universities.
- Enhancing the practical aspect and exchanging experiences through joint seminars and conferences with many parties and field visits.

Risks

- Reflection of the risks of the security situation on the lives of students.
- Lack of job opportunities after graduation, which affects students' motivation.

Improvement plan

- Identifying the educational and training programs announced by Arab and international universities and guiding students
- To benefit from it.
- Trying to find a mechanism to promote the department's program to attract Arab or even foreign students.

- Providing financial support to develop scientific, artistic, sports, cultural, and other capabilities and encouraging students to participate in fields that suit their interests and needs.
- Improving teaching and learning through continuous evaluation.
- Continuous development of the infrastructure of the department and the department as a whole.
- Encouraging teamwork among students.

2nd Axis: Objectives Academic Program

Objectives Academic Program

Strength Point

- Publishing the mission, vision, and goals of the university, college, and department on their websites.

Weaknesses

- There is no mission and vision for the educational program level.
- The lack of a mechanism to activate relations between the corresponding departments and colleges at the Arab and international levels.

Improvement plan:

- Disseminating the content and message of the department outside the institution by presenting it to stakeholders in society, such as parents of students.
- A plan must be developed to build relationships between the institution and international institutions.
- A clear strategy must be drawn up and followed to measure the criterion for achieving the goal.
- Forming a unit to develop students' non-athletic talents, noting that the college contains a sports unit in addition to sports, which already exists.
- Providing solid university education that is commensurate with scientific development
- Developing students' talents, investing in their potential, and preparing them for research work

- Developing the level of associates and increasing their scientific and practical competence for the purpose of keeping pace with scientific development
- Urging teachers to carry out scientific research and participate in scientific activities and conferences
- Organizing scientific conferences, seminars and seminars
- Organizing scientific and practical courses for department members.

3rd Axis: The Outcomes of Program

The Outcomes of Program

Strength point

- Publish the educational objectives of the university, college, and department on their websites as well.
- The teaching methods are appropriate, which facilitates the teaching work to develop the lecture method.
- The presence of a research orientation in the department.
- Follow an organized approach in the department regarding the distribution of responsibilities and management in the department.

Weaknesses:

- Limited training and development courses for teaching and administrative staff.
- Limited allocations for scientific research, fees for lectures, supervision of graduate studies, and scientific evaluation.
- Limited opportunities to exchange experiences with external universities.

Opportunities:

- Interest in obtaining accreditation.
- Signing a memorandum of understanding with different universities.
- State institutions and the private sector in Iraq need researchers specialized in life sciences.
- The need for a number of department members to contribute and benefit from agreements with corresponding universities.

- Enhancing the practical aspect and exchanging experiences through joint seminars and conferences with many parties and field visits.

Risks:

- Lack of awareness of the importance of renewable energies in obtaining sustainable, clean and environmentally friendly energy.
- Lack of awareness of the extent of the problems related to traditional energies and their harm to individuals and the environment.

Improvement plan

- Develop a plan and prepare a team to conduct visits to the institutions where college graduates work to learn about their scientific competencies.
- Conducting a survey of graduates in the labor market.
- The educational institution prepares annual evaluation reports on the contributions it has made to society in detail.
- Setting a dedicated budget to organize student training programs in specialized institutions locally and internationally.

4th Axis : Continues Improvement

Continues Improvement

Strength point

- The department began the process of continuous evaluation, evaluation and improvement.
- The preparation of the course portfolio began through lectures and ongoing advice to the faculty by the Department's Quality Assurance Committee and the Dean's Office.

Weaknesses:

- Lack of sufficient green spaces.

Opportunities:

- Continuous encouragement and support from the Dean’s Office and the Dean personally of the departments.

Risks:

- Lack of financial support.
- Lack of modern tools, methods, and techniques used in teaching and learning.

Improvement plan

- There is serious interest in addressing these weak points through instructions from the Dean sent to each department. These instructions are:

- It is necessary to provide the largest number of classrooms and equip them with all modern methods used in traditional and electronic education methods.
- Each department in the college should also be trained by experts to familiarize faculty members with new teaching and learning methods and encourage faculty members to use them.
- Identifying additional programs and courses for outstanding students.
- Evaluate educational outcomes to be compatible with local and international standards.
- Adopting other types of education (open education, distance education).
- Increase financial support for the department/section.

5th Axis :Curriculum

Curriculum

Strength point:

- Scientific topics consist of sciences that are appropriate to the student's field of study.
- Teaching methods enhance student learning in the department.
- A special committee, the Curriculum Evaluation and Review Committee, writes their proposals, if any, to develop the curriculum.

Weaknesses:

- The curriculum does not help students learn the principle of teamwork.
- The absence of mechanisms for taking the opinions of those concerned with the labor market into the program.

Opportunities:

- Coordinating with international university faculties and accrediting their programs to reduce time and effort to reach an advanced stage in curriculum development.
- Redesigning curricula to allow for interdisciplinary teaching and learning.

Risks:

- Failure to meet the changing labor market requirements and development through school curricula due to rapid developments in all fields.

Improvement plan

- Increasing the number of agreements with corresponding departments in reputable international universities to develop curricula and hosting curriculum experts in international universities to discuss mechanisms for evaluating and developing them.
- Increase financial support and increase the number of agreements with corresponding departments in reputable international universities to develop curricula.
- Develop a plan to study the curricula to be developed and select the corresponding departments.
- Curriculum development should be more flexible and generally controlled by the college.
- The curriculum must include the principle of teamwork.

6th Axis: Faculty Members

Faculty Members

Strength point:

- The teaching methods are appropriate, which facilitates the teaching work to develop the lecture method.
- There is a very good research orientation in the department.
- Strengthening the cooperation mechanism with society through cooperation channels.
- Follow an organized approach in the department regarding the distribution of responsibilities and management in the department.
- Diversity of the precise specializations of the teaching staff.
- All teachers complete their teaching quorum, in addition to assigning most of them additional hours.
- Most of the teachers received an academic promotion, especially from the rank of assistant teacher to teacher.
- The ratio of students to the number of teachers is considered somewhat acceptable.

Weaknesses:

- The small number of teaching staff holding the title of professor or assistant professor in the specific specialty of the department.
- Lack of opportunities for interaction with international academic institutions negatively affects the possibility of learning about modern methods in the teaching and learning processes.
- Limited training and development courses for teaching and administrative staff.

- Limited allocations for scientific research and fees for lectures and scientific evaluation.
- Limited opportunities to exchange experiences with external universities.

Opportunities:

- The need for several department members to contribute and benefit from agreements with corresponding universities.
- The need to benefit from the expertise of departments related to the department to develop curricula to serve the service and environmental reality in the city.
- The Foundation allocates some incentive rewards and certificates of appreciation to creative and distinguished faculty members in the fields of teaching, scientific research, and community service.
- The institution adopts some rules to develop the professional capabilities of faculty members
- Enhancing the practical aspect and exchanging experiences through joint seminars and conferences with many parties and field visits.
- Opportunities to sign research cooperation contracts with state institutions to serve society and direct research towards the applied direction.

Risks:

- The modest experience of some teachers sometimes prevents the proper implementation of the curriculum**.**

Improvement plan:

- Increase support for training programs for teaching staff by the Ministry to inform the largest possible number of teachers about the modern methods used in higher education systems in the world.

- Activating agreements between the department and corresponding departments around the world to increase teaching experience.
- Increasing opportunities for obtaining academic promotions to support initial study programs and the possibility of opening a postgraduate program in the department.

7th Axis : Infrastructure

Infrastructure

Strength point

- The number of classrooms available at the time is considered sufficient to cover the lecture schedule.

Weaknesses:

- Lack of scientific laboratories' equipment and equipment available to some laboratories.
- The level of furnishing of classrooms is considered modest.
- The department needs sufficient additional offices for faculty members.
- It is necessary to provide the department and laboratories with modern and advanced devices and equipment.
- The department needs a spacious hall for the department library and furnishing it with appropriate furniture.
- The department needs an elevator.

Opportunities:

- Developing the laboratory by subjecting it to calibration and quality requirements .Encouraging cooperation with state departments to act as a bridge between the university and society.
- Classrooms and laboratories must be available with modern equipment that is compatible with the objectives of the program and provides an appropriate educational environment.
- Providing these requirements is necessary to increase interaction between the teaching staff and students and create a suitable and encouraging climate for the development and development of the profession.

- The program must provide an opportunity for students to learn and use the latest scientific equipment
- Information technology infrastructure must be available to support the educational activities carried out by students and teachers and the educational objectives of the program and educational institution.

Risks:

- The continued limited financial allocations lead to a narrow location in the department and limited laboratory halls.
- The development of laboratory equipment is limited due to financial allocations and severe routine in this field.
- The poor performance of students in carrying out laboratory experiments concerning experiments in which one or two devices are used leads to the inability of all students to carry out the experiments themselves, but rather they are content to watch their colleagues or laboratory staff only while carrying out such experiments, which reflects negatively on the student's scientific level. Due to the importance of the practical aspect in scientific disciplines.

Improvement plan

- Increase the financial allocations necessary to build model laboratories with sufficient spaces and equipped with modern laboratory devices and equipment.
- Increase financial allocations to furnish classrooms and equip them with the necessary modern technologies.

8th Axis: Institutional Support

Institutional Support

Strength Point:

- The salaries of employees and teachers are good and are secured from the annual budget.
- The department maintains a good academic level because the financial aspect does not affect its work, which suffers from departments in which the study method depends on the financial dues the student pays to secure the study, which leads to a low academic level.

Weaknesses:

- Purchasing procedures are complex and restrictive.
- Lack of financial allocations for scientific research and insufficient financial allocations to purchase modern laboratory equipment and materials to keep pace with contemporary developments.
- Insufficient funding for scientific research.

Risks

- Financial corruption and the security situation that affects the state and its capabilities in general.
- The lack of appointments for new young cadres, even those who excel academically, limits the possibility of developing or implementing some ambitious programs.
- The department was unable to contract with administrative, technical, or teaching staff to meet its needs due to the lack of self-financing that could be used to cover salary expenses.

Improvement plan:

- Ease of securing financial resources when available to cover the department's needs for equipment and other materials.
- Activating the cooperation mechanism to provide financial resources that help cover some expenses for which resources are not available or the budget is limited.
- Adopting self-financing sources.
- Increase funding for maintenance of devices and equipment and purchase new devices.
- Ensuring integration between material resource planning and the college plan and providing financial appropriations.
- Preparing intensive training and professional development programs for specialists in the field of active investment.
- The college must have the ability to appointments, retirements, or transfers of employees.

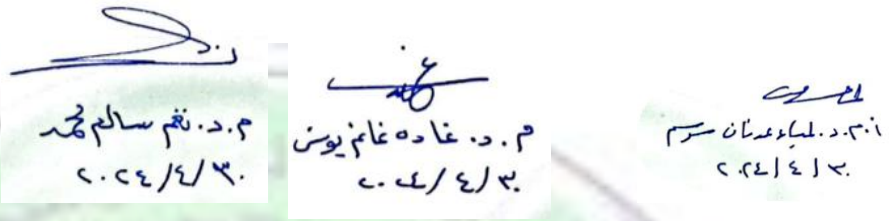
The file for completing the self-evaluation report for ABET standards for the New and Renewable Energies Department was reviewed, audited and approved by:

Scientific Committee

The signature

The name

The date

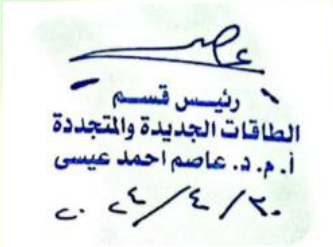


Head of Department

The signature

The name

The date

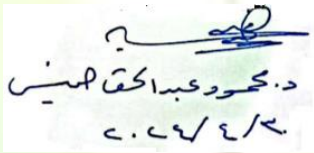


Quality Assurance and Performance Evaluation Division

The signature

The name

The date

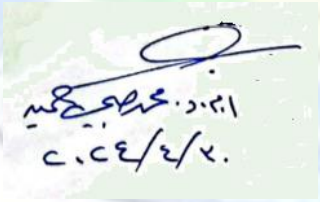


Assistant Dean for Scientific Affairs

The signature

The name

The date



Dean

The signature

The name

The date