ACQUIN
Akkreditierungs-,
Certifizierungs- und
Qualitätssicherungs-
Institut

Accreditation Report

Accreditation of

AIN SHAMS UNIVERSITY, EGYPT

FACULTY OF ENGINEERING

Mechatronics Engineering and Automation Programme (B.Sc.),
Energy and Renewable Energy Engineering Programme (B.Sc.),
Building Engineering Programme (B.Sc.)
Civil Infrastructure Engineering Programme (B.Sc.)

I Procedure

Date of contract: 07 April 2022

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Attendance by ACQUIN office: Clemens Bockmann/ Dr. Michael Mayer / Dr. Jasmine Rudolph

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Peer review experts:

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The **Assessment Report** of the peer-review experts is based on the self-assessment report of the Higher Education Institution (HEI) and extensive discussions with the HEI management, deans and/or heads of the departments, heads of study program(s), lecturers, staff representatives, students, and alumni.

The basis of the **Assessment Criteria** is part 1 of the "Standards and Guidelines for Quality Assurance in the European Higher Education Area" (ESG) in the current official version. At the same time the national context, particularly the national regulations regarding the establishment of study programs, are considered.

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II Introduction

The experts would like to thank the representatives of the Ain Shams University Cairo (ASU) as well as students that they have taken part in the discussions and willingly shared information and their views during the site visit. The discussions are valuable not only for the assessment of the institution, but also for a better understanding of the legal and sociocultural context of the local higher education system.

Evaluation basis for the peer-review experts is the self-assessment report of the ASU as well as intensive discussions during the online conference with the ASU management, deans and/or heads of the departments, heads of the study programmes, study programmes coordinators, teachers, lecturers, administrative staff, students, and graduates.

Main objective of the accreditation procedure is to assess the quality of the study programmes and compliance with the "Standards and Guidelines for Quality Assurance in the European Higher Education Area" (ESG). The ESG standards are applied as main assessment criteria in the international accreditation procedure. In addition, the respective country-specific criteria and standards are taken into account.

A group of experts was set up, which ensured that all areas relevant to the accreditation procedure (e.g. legal, structural, social etc. aspects) as well as the ESG, the Salzburg Recommendations, and national criteria were considered. The peer-review experts include professors, representatives of the professional practice and the student representative. A certificate with the ACQUIN seal is awarded upon accreditation of the study programmes.

1 The Higher Education System in Egypt

(will be completed by ACQUIN)

2 Short profile of HEI

2.1 Ain Shams University

“Ain Shams University” (ASU) was founded in 1950 under the name of “Great Ibrahim Pasha University” by decree of King Farouk. ASU is the third-oldest public Egyptian university after the Al-Azhar-University (founded in 975) and the University of Cairo (founded in 1908). Dr. Taha Hussein, Minister of Education at that time, adopted the project to establish the university with eight scattered faculties. In 1951, the Site Selection Committee of the Ministry of Works agreed to allocate a plot of land of 196 acres of government property as a site for building the new university faculties. In 1952, Major General Muhammad Naguib gifted the Saffron Palace to the University as its administrative headquarter. In the revolution of 1954 the university’s name was changed to “Heliopolis” temporarily before it was changed the same year to the existing one “Ain Shams”.

The university includes eighteen faculties offering under and post graduate studies: Arts, Law, Business, Sciences, Engineering, Medicine, Agriculture, Woman (for Arts and Sciences), Al-Alsun (languages), Education, Pharmacy, Dentistry, Computers and Information, Specific Education, Nursing, Archaeology, Veterinary, and Media and Mass Communications. In addition, there are three faculties/institutes for postgraduate studies: The Faculty of Postgraduate Childhood Studies, the Faculty of Graduate Studies and Environmental Research, and the Arid Land Agricultural Research Institute.

ASU comprises seven campuses, all of which are sited in Greater Cairo. The university administration, faculties of Arts, Law and Science are all located in the main campus, El-Khalifa El Mamoon Street, Abassia. The faculties of Business, Al-Alsun (languages), Pharmacy, Dentistry, Computer and Information Sciences, Institute of Postgraduate Childhood and Institute of Environmental Studies and Research, together with the specialized Hospital are located on the second campus on the other side of the mentioned street. The Faculty of Medicine and Faculty of Nursing together with the university hospitals are located in another campus at Abassia. The Faculties of Engineering, Specific Education, Education, Women and Agriculture are located each on a separate campus in Abassia, Heliopolis and Shoubra El-Kheima, respectively.

In 2021, ASU has thirty-eight academic staff members (five of them in the faculty of Engineering) listed on the best 2% of the world scientists published by Stanford University.

Vision, Mission, Goals and Objectives

The Vison of the ASU is: “Ain Shams University aspires to achieve a global competitive advantage in managing innovation system in education, research, knowledge, and community.” The Mission statement: “Ain Shams University is a research, educational and service institution that adopts innovation and qualifies a graduate capable of competing in the labour market and community service in accordance with the latest international developments.”

Ain Shams University aims to create an innovation-stimulating environment, internationalize its activities, provide full access to education and research, and develop skills and intellectual discipline to meet the ever-changing needs of the society.

This can be achieved through:

1. Promoting education through innovative and future-oriented learning
    - 1.1. Innovation in teaching, learning and assessment.
    - 1.2. Internationalization of educational activities to raise ASU global profile and to support international students.
    - 1.3. Increasing ASU staff based on and in proportion to student numbers in light of standard rates.
2. Encouraging scientific research and supporting innovation
    - 2.1. Enhancing the infrastructure for scientific research and innovation.
    - 2.2. Developing scientific research resources.
    - 2.3. Developing and training researchers to pave the road for innovation and technological advancements.
    - 2.4. Promoting technology, technological incubators, and entrepreneurship through local and international partnerships.
    - 2.5. Full integration of research labs and optimum use of our resources.
    - 2.6. Promoting cooperative research between ASU, community institutions and labour market.
3. Sustainable development and internationalization of university
    - 3.1. Innovation in marketing and internationalizing university services
    - 3.2. Strengthening the role of ASU in community development to meet the requirements of sustainable development.
    - 3.3. Developing ASU abilities in terms of alumni employability and career support.
    - 3.4. Improving infrastructure, ICT performance and learning environment.
    - 3.5. Boosting the performance of ASU centres and units and developing our own resources.

4. Developing ASU administrative apparatus and automating its services
    4.1. Training, qualifying, and developing the capacities of ASU administrative apparatus.
    4.2. Automation of administrative services by computerizing files.
    4.3. Developing administrative procedures and helping sub-departments to become ISO-certified.
    4.4. Promoting a positive work environment and maximizing its efficiency.
5. IQA and performance evaluation systems
    5.1. Enhancing ASU to get accredited locally and internationally.
    5.2. Proceeding with the accreditation of ASU's faculties and institutions.
    5.3. Harnessing technology to create a system for internal quality assurance (IQA) and performance evaluation.

2.2 Short Portrait of the Faculty of Engineering

The history of the Faculty of Engineering (FoE) goes back to 1839. It was first known as the School of Technical Operations. In 1932, it was further developed to the School of Applied Engineering. In 1946, it was announced as the High Institute of Engineering by a Ministerial Decree. In 1950, Law 93 established Ibrahim Pasha University and the High Institute of Engineering was the base of the Faculty of Engineering. The FoE offers twenty two undergraduate study programmes and thirteen postgraduate study programmes through its thirteen scientific departments. Eleven of the undergraduate study programmes have partnership with three European universities and students of these study programme obtain dual bachelor's degrees from ASU and the European partner. FoE issues an open access international Engineering journal (https://www.journals.elsevier.com/ain-shams-engineering-journal) published by Elsevier B.V since 2010. The vision and the mission of FoE are fulfilling the same ones of ASU but from Engineering perspective. Vision: "The Faculty of Engineering, Ain Shams University seeks to be a distinguished national and regional centre in engineering education, scientific research and innovation in engineering sciences in order to achieve the sustainable development of the society." Mission: "The Faculty of Engineering - Ain Shams University is a nationally and regionally renowned institution in graduating talented engineers capable of innovating and keeping abreast of the global development at engineering disciplines to meet the needs of regional and international employment markets and entrepreneurship. It also develops scientific and engineering knowledge to meet the needs of society and sustainable development goals."

3 General information about the study programmes

3.1 Mechatronics Engineering and Automation Programme (B.Sc.)

Location	Ain Shams university (ASU)
Date of introduction	September 2014
Faculty/ department	Faculty of Engineering
Standard period of study (semesters)	10
Number of ECTS credits	300
Number of study places	120
Number of students currently enrolled	789
Average number of graduates per year	100
Form of study	full-time
Tuition fee	Per semester 48.000 EGP (=1.500 Euor)

3.2 Energy and Renewable Energy Engineering Programme (B.Sc.)

Location	Ain Shams university (ASU)
Date of introduction	September 2009
Faculty/ department	Faculty of Engineering
Standard period of study (semesters)	10
Number of ECTS credits	300
Number of study places	80
Number of students currently enrolled	495
Average number of graduates per year	80
Form of study	full-time
Tuition fee	Per semester 48.000 EGP (=1.500 Euor)

3.3 Building Engineering Programme (B.Sc.)

Location	Ain Shams university (ASU)
Date of introduction	September 2007
Faculty/ department	Faculty of Engineering
Standard period of study (semesters)	10
Number of ECTS credits	300
Number of study places	120
Number of students currently enrolled	180
Average number of graduates per year	100
Form of study	full-time
Tuition fee	Per semester 48.000 EGP (=1.500 Euor)

3.4 Civil Infrastructure Engineering Programme (B.Sc.)

Location	Ain Shams university (ASU)
Date of introduction	September 2019
Faculty/ department	Faculty of Engineering
Standard period of study (semesters)	10
Number of ECTS credits	300
Number of study places	80
Number of students currently enrolled	86
Average number of graduates per year	No alumni yet
Form of study	full-time
Tuition fee	Per semester 48.000 EGP (=1.500 Euor)

4 Short portraits of the study programmes

4.1 Short portrait of Mechatronics Engineering and Automation Programme (B.Sc.)

Mechatronics is a combination of various engineering disciplines. It is concerned with the development and production of intelligent electromechanical products and devices. Products produced using Mechatronics principles have become an integral part of modern civilization. In the last decade, there has been a significant increase in the demand for engineers with adequate knowledge and experience in Mechatronics.

The BSc in Mechatronics and Automation study programme was introduced at Ain Shams University's Faculty of Engineering in 2014. The Mechatronics and Automation study programme integrates multidisciplinary fields of science that includes mechanical engineering, Electronics, computer Science and control Engineering to enhance the safety, performance, efficiency, and the ability of solving real life problems associated with mechanical systems, industrial automation, mechatronic in automotive applications, mechatronic in healthcare and biomedical devices, nano/micro mechatronic systems.

The Mechatronics and Automation Engineering degree provides four different fields in which the students in this study programme can specialize. These four fields are: Autotronics, Nanomechatronics, Industrial Mechatronics, and Bio-Mechatronics. Each concentration includes 5 compulsory courses as the following.

Objectives for the bachelor programme

The objective of the mechatronics and automation study programme is to provide the graduate with the essential knowledge and best educational experience that prepares graduates to tackle a wide range of problems in our rapidly evolving complex environments. After the completion of the Bachelor of Science degree, a graduate will be able to:

1. Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.
2. Use the basic theoretical and practical knowledge of mechatronic and automation system components in his/her practical field.
3. Design a system, component, or process to find affordable and reliable solutions, to improve the daily quality of life.
4. Conduct Research and Development (R&D) activities to create innovative mechatronic solutions having direct impact on industrial, commercial, and social scales.

5. Apply the learned management and business skills to effectively contribute and compete in local, regional and international markets.
6. Engage in self- and life- long learning.
7. Work within a multidisciplinary team during the analysis, design and implementation phases of mechatronics engineering projects

Career opportunities

Our graduates are expected to have productive and very rewarding careers in a variety of capacities. The graduate of the study programme is expected to get a job in one of the positions at Embedded systems, Projects using Heavy earthmoving equipment and hydraulic and pneumatic machines, Sales engineer for robotics and automation, Automated manufacturing and production systems, Control engineer, Maintenance engineer, Robotics and automation industry or also Automobiles Industry.

4.2 Short portrait of Energy and Renewable Energy Engineering Programme (B.Sc.)

The study programme is an interdisciplinary study programme that covers the energy studies from electrical and mechanical points of view. It aims to study both conventional energy and renewable energy sources. Energy's flows, constraints, generation, transmission, distribution, consumption, and management knowledge are acquired through the period of study. Students are provided with a deep knowledge of conventional and renewable energy technologies generation and applications. Thermal power plants, machine construction, design, and stability are topics covered. Hydro, tidal, wave, wind, solar photovoltaic, solar thermal, concentrated solar power, biomass, geothermal and others are studied. Renewable energy applications are illustrated and evaluated both theoretically and economically. Power system networks (transmission and distribution) control and modelling are explained. Energy management is discussed in detail using demand side management, energy efficiency, and energy consumption and audit are explained in detail. Finally, the study programme encourages problem identification and solving as well as critical thinking skills. All topics under study prepare the study programme graduates for the national, regional and international energy job market.

There are the two concentrations of power generation and energy management in this study programme. The Power generation focuses on the Power generation field taking into consideration conventional (thermal) and renewable energy (hydro, tidal, wave, wind, solar photovoltaic, concentrated solar power, biomass, geothermal …etc.), and waste conversion generat-

ing power stations. Power system analysis, stability, reliability, modelling, and advanced control are a core direction in this concentration. Graduates from these concentrations are qualified to join electricity utilities such as generation (public and private) and transmission entities. The graduation project could focus on the design and the evaluation of possible uses of renewable energies, power delivery systems analysis and control.

The Energy management tackles the energy management field that includes energy auditing, energy efficiency, clean energy technologies, and demand side management, taking into consideration power quality standards and economical aspects. This management as it is carried out is subject to international and national quality control, and quality systems and assurance methodologies. Renewable energies applications are studied such as: water desalination and distillation for industrial and residential activities, local production of energy in remote areas, energy storage …etc. Graduates from this concentration are qualified to work in electrical distribution systems' installations, design and operation of refrigeration and air conditioning systems, management departments of large projects/industries, distribution companies (public and private) …etc. The graduation project could focus on energy efficiency standard applications, wiring in distribution level, solar pumping, Power generation for domestic purposes and their impacts on power quality, compressor work requirements for cooling loads in air conditioning projects.

Career opportunities

This study programme qualifies its graduates to work in electrical power engineering, mechanical power engineering, energy, and renewable energy engineering fields. Graduates can join electrical sector entities such as generation (conventional and renewable), transmission, and distribution companies either public or private. Power plants, control centres, petroleum industry, factories, maintenance applications, and energy management sectors can be a target for the study programme's graduates. Distribution installations, refrigeration and Air Conditioning, water desalination and distillation applications, and solar pumping fields are candidate jobs for the energy graduates.

4.3 Short portrait of Building Engineering Programme (B.Sc.)

Building engineering is a broad discipline concerned with the design and management process of construction and building projects. Building engineering study programme use mathematics, natural sciences, engineering, and human sciences to provide easier life for humankind.

Building engineers are responsible among their community, industry, or society for establishing safe, economic, healthy, and convenient accommodation for every individual in society.

Graduates of the Building Engineering study programme are responsible for planning, designing, and managing construction processes as well as selecting and designing adequate repair procedures for structures of all types.

The graduates of the study programme will be well versed in building technology, social, and environmental issues. The study programme aims to provide the graduates with the advanced concepts of steel and concrete structures design, according to recent design codes versions. Also, understanding of dynamic, earthquake, using recent design codes versions, and management of project recourses, risk, safety which essential knowledge for structure engineer.

Objectives for the bachelor programme

The graduates of the engineering study programmes should be able to:

1. Apply knowledge of mathematics, science, and engineering concepts to the solution of engineering problems.
2. Design a system; component and process to meet the required needs within realistic constraints.
3. Design and conduct experiments as well as analyse and interpret data.
4. Identify, formulate, and solve fundamental engineering problems.
5. Use the techniques, skills, and appropriate engineering tools necessary for engineering practice and project management.
6. Work effectively within multi-disciplinary teams.
7. Communicate effectively.
8. Consider the impacts of engineering solutions on society & the environment.
9. Demonstrate knowledge of contemporary engineering issues.
10. Display professional and ethical responsibilities, and contextual understanding
11. Engage in self- and life- long learning.

Career opportunities

The following jobs are some of opportunities that can be pursued by the study programme graduates: Structure design engineer, Field engineer, Cost estimator or Planning /scheduling engineer.

Graduates of the study programme will be qualified for positions at companies specializing in the design, analysis, operation, construction, and management of a wide range of residential, commercial, and industrial building projects. Our graduates can be found at numerous companies and organizations like Government authorities, Consulting firms in civil engineering and construction, Civil engineering contractors and project managers and Environmental engineering organizations.

4.4 Short portrait of Civil Infrastructure Engineering Programme (B.Sc.)

Civil Infrastructure Engineering has been offered at ASU since the academic year 2019-2020 and is a well-established study programme at the University.

Civil engineering today is concerned with the deterioration of the nation's roads, bridges, water and power distribution systems, storm and sanitary sewers and other public infrastructure. The aim of the Civil Infrastructure Engineering Study programme is to graduate civil engineers responsible for the life cycle of the system he/she creates and must be capable of optimizing the total system performance of large-scale public works projects, including their social and environmental impacts, in a way that addresses critical issues of infrastructure behaviour, deterioration science, and structural rehabilitation. On top of these fields comes surveying engineering, sanitary environment, transportation engineering, water-related engineering projects who can enrich the water resources and public works field.

The Civil Infrastructure Engineering study programme is a 5-year full-time degree study programme which includes a foundation year and three (4) years for the specialized courses. In their senior year, students choose between four tracks of specialization: Transportation Engineering, Geomatics, Environmental Engineering and Water Engineering.

Objectives for the bachelor programme

This study programme is designed to:

- To produce graduates with the required breadth and depth of theoretical and practical knowledge of established technologies and methods in Civil Engineering.
- To augment the intellectual capacity to produce creative solutions to society's needs.

- To prepare students to acquire the individual skills and ethics required for long-term learning and competent professional practice.
- To stimulate design creativity and critical thinking.
- Acquire and utilize personal, communication, and leadership skills and be able to work collaboratively in a multidisciplinary team.

III Documentation and assessment of the criteria

1 ESG Standard 1.1: Policy for quality assurance

Institutions should have a policy for quality assurance that is made public and forms part of their strategic management. Internal stakeholders should develop and implement this policy through appropriate structures and processes, while involving external stakeholders.

1.1 Documentation

1.1.1 General policy of quality assurance

The Vision of Cairo Ain Shams University is to have a global competitive advantage in managing an innovative system of education, research, knowledge and community service. So both teaching and research shall be at European standards.

Ain Shams University is an educational, research and service institution that adopts innovation and qualifies, academically and skilfully, a graduate capable of competing in the labor market and community service in accordance with international developments. A combination of teaching and applied research ensures the employability of its students, matching the needs of the region.

The Mission is Provide a diverse student body with the education required to become highly qualified and socially responsible graduates. The University fosters creative and critical thinking to advance research and innovation and, through this, aims at serving society.

The Values of Cairo Ain Shams University is committed to ethical principles in all of its undertakings. In particular, the University welcomes students and staff from both genders, and all ethnic, geographical, cultural, and religious backgrounds. The University encourages association in peace and with tolerance and welcomes further intercultural exchange between Cairo and the World.

To make sure to reach their goals the University has a Quality Assurance center which secures the Quality of the whole University and guides the Quality systems of each faculty.

1.1.2 Faculty policy of quality assurance

The Faculty of Engineering of the Ain Shams University (FoE) is committed to the quality and standards of education offered. The faculty adopts a system of continuous monitoring, review, and evaluation of all study programmes offered to ensure the quality and standards of teaching and learning at FoE. The aims of the system are:

- To ensure that each study programme is planned, operated and developed in such a way to achieve the educational objectives that are consistent with the overall faculty mission and vision.
- To convey qualifications to graduates who are in line with the needs and requirements of the Labor market.
- To monitor and ensure the progress of the study programme and satisfy its objectives.
- To review and evaluate the progress and future development of all educational study programmes.
- To apply peer review principle in developing and continuously improving the quality of study programmes through utilizing the wide range of expertise, both internal and external.

1.1.3 Continuous Improvement & Quality Assurance Unit (CIQAU)

1.1.3.1 Objectives of the CIQAU

The Continuous Improvement & Quality Assurance Unit (CIQAU) of the FoE adopts a set of goals that are compatible with the institution's strategy and objectives, which can be summarized as following:

1. Achieving a distinguished level of performance in the management of the quality assurance system at the faculty. Raise the level of institutional performance in terms of (academic, research, administrative and service). Ensure that all study programmes gain accreditation from local and international bodies.
2. Following up faculty strategic plan and its action plan implementation.
3. Providing technical support to staff to ensure the quality of the educational service provided and qualify study programmes for accreditation.
4. Developing the capabilities of faculty members, supporting staff, and administrators in the field of education quality and accreditation.
5. Working on developing the measurement and the evaluation system in the faculty in accordance with modern and automated evaluation methods.
6. Managing a system for monitoring and evaluating performance at the faculty in accordance with academic performance standards and indicators.
7. Contribute to establishment of digital systems, which allow the automation of information recall and decision-making support.

1.1.3.2 Administrative structure and job description of CIQAU

CIQAU's administrative structure consists of a director, two deputies and other members:
CIQAU's director is appointed by a decision from the Faculty Council and is a member of the faculty council. The director is responsible for supervising the unit's employees like also supervising the task for the unit and for preparing the necessary action plan. Furthermore, he prepares reports for the Council and for the dean and communicates with the University's Quality Assurance Centre and with the National Authority for Quality Assurance and accreditation of Education (NAQAAE) to be updated with all related Quality activities.
A member of CIQAU is a faculty member in the FoE appointed by a decision of the unit director, after nomination by the scientific departments and works under the supervision of the unit director with regard to all quality activities. Associate members of CIQAU are selected from department's staff and work under the supervision of the unit director to meet the administrative and financial quality requirements.

1.1.3.3 Duties of the permanent members of CIQAU

The faculty's departments are jointly responsible for all procedures and implementation of the quality systems in their departments. The CIQAU is the body that monitors and provides technical support to ensure the actual and practical application of quality activities.

1.2 Assessment

The ASU's strategy (2018-2023) is published in the university's website (in Arabic), showing its vision, mission, goal, aims, values, and priorities. The national academic reference standards issued by the Egyptian National Authority for Quality Assurance and Accreditation in 2018 (NARS-2018), is taken into account while designing the programs and defining the bylaws for each program in all faculties. Following up on fulfilling all quality assurance requirements and relevant international bodies targeted by the Faculty's strategic plan. The Philosophy of the Reference Framework for Designing the Academic Programs is flexible to accommodate diversity and excellence and be able to express the human and material capabilities of the educational institution. At the same time, there is compatibility between the regulations and programs of the faculty, as well as taking into account the standards of international accreditation bodies for academic engineering programs.

• The programs contain courses in the social sciences, humanities, general culture, besides to the main scientific focus of each program to develop personal and general skills. These courses are carefully selected to shape the graduate's personality and skills to be in line with the labor market.
• The number of weekly study hours (Contact Hrs.) is defined and apply the concept of student workload (SWL).
• Modern teaching methods are used and trying to avoid direct memorization, while taking advantage of students' ability to learn independently, which helps to motivate them to develop their abilities, and what this requires of changing assessment methods.

On the faculty level, there is Director of the Quality Assurance and Continuous Development Unit, who is a member in each of the Programs Administration Boards. Programs Administration Boards are responsible for the Suggesting policies to maintain the teaching and learning quality in the Programs, among other tasks in the programs within its scope. Within each program, the responsibilities of each of the program director and program executive director, following up on fulfilling all quality assurance requirements according to the standards of the National Authority for Quality Assurance and Accreditation of Education and relevant international bodies targeted by the faculty's strategic plan, Supervising the fulfilment of all quality assurance requirements in coordination with Continuous Development and Quality Assurance Unit. Relation to Sustainable Development Goals are marked for each program in the 2023 bylaws, but without any explanation how the Sustainable Development goals are achieved through the education programs or activities.

The quality assurance policy is published briefly on the website, through showing the structure of the CDQAU structure, vision, and mission. The Bylaws of 2018 are published online on the faculty's website.

The ASU has an appropriate strategy for quality assurance. It had established quality assurance measures. The monitoring of the study programs is carried out with the help of appropriate procedures: The quality policy and processes are therefore well developed, the deep understanding of the importance of the organizational tasks of quality assurance must be positively emphasized.

The basic structure and approach of the Quality management system are very well documented; planning (Plan) and implementation (Do) are also clearly described, as are the audit stage (Check) and action (Act). It is therefore positive to emphasize that the ASU has implemented a comprehensive quality management system. The university has created a quality culture that is accepted by all members of the university and is regularly reviewed and improved. In the opinion of the expert group, the university has a very good formal quality assurance strategy in which all control loops are closed, interlock very well and work together. Internal quality assurance tools are widely available and known to all staff and students. The quality assurance policy covers all key areas and informs all members of the university regularly and transparently about the use of quality assurance tools. The development plans of the study programs to be accredited and the quality assurance policy of the study programs approved by the university management reflect the relationship between academic research, teaching and training and thus fully confirm the existence and functioning of the internal quality assurance system of the study programs.

1.3 Conclusion

The criterion is **fulfilled**.

2 ESG Standard 1.2: Design and approval of programmes

Institutions should have processes for the design and approval of their programmes. The programmes should be designed so that they meet the objectives set for them, including the intended learning outcomes. The qualification resulting from a programme should be clearly specified and communicated, and refer to the correct level of the national qualifications framework for higher education and, consequently, to the Framework for Qualifications of the European Higher Education Area.

2.1 Documentation

2.1.1 General aspects

To unify the standards for preparing academic study programmes in universities so that they have a clear and specific purpose, the Supreme Council for Higher Education (CHE) in Egypt has developed a framework for creating study programmes.

2.1.1.1 The basics of designing academic study programmes according to the framework of CHE

The design of study programmes begins with the defining of the competencies that graduate should obtain. This is based on comprehensive studies of the local and international references. These studies consider the requirements of the stakeholders as well as the standard requirements and the local and international accreditation bodies for engineering study programmes. From it, the required knowledge and skills are determined and in a last step the courses content and qualification targets are defined. The study programme specification contains the list of skills that students acquire during their studies and shows the extent to which these skills are acquired through the proposed courses (Mapping skills to courses) in a modern learning method and integrates them into the courses. Courses are designed to build upon each other that no repetition of scientific content occurs, or any content is missing from the curriculum.

The following should be considered while designing the study programme:

- Increasing the dose of practical with the expansion of the establishment of virtual laboratories.
- Reviewing the objectives of the exercise groups and determining the process by which they will achieve their goal.
- Revise the basic science courses.

- A project is a course, and the duration of it will be extended after the final exams, it requires preparation of a report and implement the required practical part, while linking the projects' projects to the local industry and the services of the surrounding community.
- Paying attention to teaching humanities, social sciences and general faculty courses
- Paying attention to field training.
- Assessment of student performance depends on the nature of the course.
- The results of the continuous assessment must be known to the student.
- The student must have opportunities to choose some courses.
- It is necessary to hold workshops to train faculty members on the method of continuous assessment and preparation of examinations to measure the extent of the assessment.
- Development of a variety of international skills and computer applications are integrated into the curriculum of courses to develop them in an integrated manner.

Modularisation

All programmes at Ain Shams University are modularized programmes, meaning that they consist of individual, subject-grouped courses with lectures, exercises, exams, etc. Each course can be passed and transferred individually (if pre- requisites are met), allowing for individual study paths and international mobility. No course exceeds the duration of one semester.

Course Specifications are regularly reviewed by the respective departmental Curriculum Committees and archived in a repository. The teaching staff may initiate minor changes to the Course Specification. A Course Specification must at least contain the following information: Course Code, Course Title, Credit Points, Catalogue Description, Prerequisite(s), Co-requisite(s), Requirement, Learning Outcomes, Topics, Distribution of Student Workload, Forms of Learning, Forms of Assessment and Weighting, Requirements to pass the Course, Textbooks/Recommended Reading/Supporting Material, Faculty`s Member/Instructor, Semester, Start Date and End Date.

2.1.1.2 Design and approval of study programme at Faculty of Engineering (FoE)

2.1.1.2.1 International Credit Hours Engineering Programmes (ICHEP) in 2006

International Credit Hours Engineering Programmes at the FoE (ICHEP) is one of the outstanding models for engineering education in the Arab Republic of Egypt, as it seeks to provide high-quality of engineering education based on interdisciplinary study programmes and the

application of the international standards of credit hours systems. Learning environment at ICHEP focused on the graduation engineers equipped with skills, knowledge, and the ability to life-long learning.

ICHEP began at the FoE in 2006 with the two study programmes “Building Engineering” (BLDG, B.Sc.) and “Materials Engineering” (MATL, B.Sc.) with a number of students that does not exceed 60 students. Now, there are eleven study programmes: MCTA, ERGY, BLDG, CISE, Communication Systems Engineering (COMM), Materials Engineering (MATL), Manufacturing Engineering (MANF), Computer Engineering and Software Systems (CESS), Landscape Architecture (LAAR), Environmental Architecture and Urbanism (ENVR), and Housing and Urban Planning (HOUD). The total number of students of these eleven study programmes exceeds 3,500 students that study side by side with the Egyptian, mainstream study programmes. There are plans to add more study programmes in the near future like Petrochemical Engineering.

ICHEP is characterized by adopting new models in learning, which are different from the traditional system in Egyptian Engineering colleges. Moreover, the curriculum adopted in ICHEP are inspired by the vision of international experts and specialists in these fields. The study programmes in ICHEP follow mainly NAQAAE’s guidelines. All ICHEP programmes are engaged in double degree programmes with internationally accredited university in Europe.

In 2006, the Study programme Development Committee, together with the ICHEP board, formulated a proposal to launch new study programmes in view of the needs of the Egyptian society. Then a group of relevant scientific departments (study programme preparation team) participated in the design of the study programmes.

The design of the study programmes started with studying the mission and vision of FoE and a draft of mission is considering the personality of the study programme and its main role in society, whether inside or outside the faculty. It is also highlighting the level and quality of the provided service and taking the opinion of the beneficiaries of the study programme

The draught mission is discussed in the form of an opinion or a questionnaire on the faculty community, which includes faculty members, support staff, administrators, and labor market representatives. The analysis and results of opinion polls are discussed, and the mission's final picture is developed.

Graduate attributes and study programme goals are then formulated to achieve the mission. The study programme preparation team collaborated with many faculty members and their assistants, administrators, and labour market representatives to define and formulate the study programme goals and graduate attributes after:

- Reading and studying the frame reference for preparing study programmes released by the Supreme Council for Higher Education in Egypt
- Reading and analysing the national academic standards document for the engineering sector.
- Reading and analysing the document of the national academic standards for the engineering sector, specializing in relevant study programme
- Analysis of the goals of similar study programmes internationally

Next, the study programme specification and intended learning outcomes (ILOs) were defined to achieve the study programmes' goals. The relevant community parties participated in formulating ILOs of study programmes, represented by the expertise available to faculty members through their work in engineering consultancy, in addition to the advisory industry board, which includes heads of companies related to the study programme's specialization. The courses' specification includes a matrix of the intended learning outcomes, and the course content is prepared. The bylaw including the studying regulation, curriculum and study plans are created. The ICHEP Board, Faculty Council, and finally the Supreme Council of Universities approved the study programmes' bylaw, and there is a ministerial decision to launch study programmes in 2007.

2.1.1.2.2 Renewal of the study programmes in 2014

In 2014, the new study programme "Mechatronics Engineering and Automation Programme" (MCTA) was introduced, and the old ones were reviewed. The new ones were introduced following the same procedures as the old ones. The ICHEP Board, Faculty Council, and, finally, the Supreme Council of Universities approved the study programmes' bylaw, and a ministerial decision has been made to begin study programmes in 2014.

The FoE was accredited for five years by the National Authority for Quality Assurance of Education and Accreditation (NAQAAE) in 2014, accrediting all its study programmes. The framework for NAQAAE was established in 2006 by a presidential decree to enhance the quality of education in Egypt with a mandate to ensure the development of basic reference standards for education – National Academic Reference Standards (NARS).

The study programme is periodically reviewed by evaluation of internal and external auditors, exit survey, questionnaires about the extent of labour market satisfaction with the graduate's attributes, and through the comments of the faculty member in the study programme report. The study programme is reviewed at the end of the academic year. The results of the review are used to update and develop the study programme, as some courses content were reviewed at the request of the external and internal auditor.

Updating the mission begins with the periodic update of the university and faculty mission in accordance with the needs of the labour market and the ongoing research in the study programme, as well as with the study programme's objectives. Where the study programme mission is reviewed according to changes in the internal and external environment of the study programme.

Which can be identified as:

1. Changing the study programme's academic regulations
2. Issuing national standards
3. Issuance of a frame of reference from the engineering sector
4. Issuing a national plan/vision
5. Issuing a strategic plan for the university/the institute
6. Changes in the labour market in the field of work of the graduates of the study programme are monitored by experts and specialists.

Graduate attributes are reviewed annually using the following mechanisms:

- Extrapolating the opinions of faculty members participating and not participating in the study programme.
- Extrapolating the opinion of the labour market on the graduate's level and specifications after being employed for at least one year.
- Poll the opinion of graduates at least one year after their graduation to find out their opinion of what has been studied in the study programme and their opinion of their level and skills compared to their fellow graduates from debate study programmes and the shortcomings they faced, which they see the need to avoid in the future.

2.1.1.2.3 Changes in 2018 and re-accreditation in 2022

In 2018, the mission of all study programmes has been updated, the goals and the graduate attributes are renewed to comply with the amendments to the standards of the represented in NARS 2018. The graduate's attributes were determined based on the community's actual needs. It was determined with the participation of a variety of relevant parties, such as academic leaders, faculty members, and labour market representatives, as well as effective communication with the labour market and relevant industrial parties, such as the advisory board and many associations of industrial cities investors, as well as representatives of the many companies that adopt the implementation of graduation projects study programme students. The conference of the advisory industry board, is made up of the leaders of organizations that need study programme graduates, decide on the required attributes of the graduates. In these

conferences, specialized sessions are held, which are round-table discussions, and the session is moderated by the study programme coordinator, and a group of faculty members, academic advisors and a group of study programme students are invited, they discussed topics like the strategic objectives of the study programme and how the labour market can benefit from them, Challenges facing the study programme, Required goals from the industry's point of view like also a tour of the laboratories that serve the study programme, as well as the graduation projects and various student activities for the students of the study programme
To comply with the amendments to the academic reference standards represented in NARS 2018, the adopted study programmes' standards have been updated which adopt competences rather than ILOs. A new bylaw has been created. This bylaw was approved in Ministerial Resolution No. 4319 of September 18, 2018.

All relevant parties were made aware of the adopted standards, re-educated when the adopted standards were updated using the mechanisms of awareness seminars for Faculty members and their assistants and a student guide to the study programme, as well as the study programme's official website on the internet.

On February 24, 2018, and in 2020, the faculty's Quality Unit held a workshop to familiarize the study programme's members with the updated National Standard.

In 2022, the study programmes were accredited for five years by the National Authority for Quality Assurance of Education and Accreditation (NAAQAE).

For each Study programme in this curriculum, the European Credit Transfer and Accumulation System (ECTS) is given as a numerical descriptive value of qualification expressed in terms of Student Workload (SWL). It is defined as "the number of working hours typically required to complete the learning activities of course units in order to achieve their expected learning outcomes". This system was adopted through the Bologna declaration in 1999 at the University of Bologna in Italy to facilitate the mobility of students through Europe. The total SWL comprises two components: "Structured" (SSWL), which is the scheduled teacher-contact hours interventions and "Unstructured" (USWL) which is the time spent by students in their own self-study, completing course assignments, and preparing for all types of exams, e.g., assessment workload.

One ECTS credit corresponds to 25 hours of total student working, and each 15-weeks academic semester should meet 30 ECTS. As an agreed requirement, 750 hours of total SWL are necessary in a full academic semester, or about 50 hours of total SWL/per week. Expected values for each semester are 16-19 Credit Hour (CH), 25-28 Contact hours per week for 15 weeks, 750 hours of total student workload which results in a total 30 ECTS.

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

2.1.1.2.4 Consistency with EQF and NARS

A study programme's academic standards should refer to the appropriate level of the Framework for Qualifications of the European Higher Education Area (EQF). The Egyptian Qualifications Framework NAAQAE differs from the European one, but they share some similarities. Bachelor study programmes correspond to EQF level 6.

2.1.1.3 General Study programme requirements

- The official teaching Language is English, and the Faculty of Engineering will ascertain the student's English Language proficiency. Textbooks, assignments, and examinations are all in English.
- The Study programmes follow the Credit-Hour (CH) system. This is a measure of the contact hours between the teachers and the student per semester. One Credit Hour is equivalent to the course Contact Hours as follows:
    - One Hour weekly lecture for a semester of 15 weeks.
    - Two Hours weekly tutorial for a semester of 15 weeks.
    - Three Hours weekly Laboratory work for a semester of 15 weeks.
- One Contact Hour is divided into 50 minutes of actual teaching and 10 minutes break.
- For each course and Study programme in this curriculum, the European Credit Transfer and Accumulation System (ECTS) is given as a numerical descriptive value of qualification expressed in terms of Student Workload (SWL). It is defined as “the number of working hours typically required to complete the learning activities of course units in order to achieve their expected learning outcomes”. This system was adopted through the Bologna declaration in 1999 at the University of Bologna in Italy to facilitate the mobility of students through Europe.
- It has been considered as an essential description of the educational qualification recommended in the European Higher Education Area as a key element of the Bologna and Europeans Framework Qualifications in terms of total SWL.

2.1.1.4 The Study programmes Administration Board

The Study programmes Administration Board is responsible for the strategic planning of the Study programmes like also for marketing activities for the Study programmes.

The board cares about conducting feasibility studies of opening and freezing Academic Study programmes and about all financial issues related to the operation of the Study programmes.

The Academic Development of the Study programmes and any exception to the rules in the Faculty Bylaws and Regulations are also the responsibility of the bord. It is also suggesting policies to maintain the teaching and learning quality in the Study programmes. The base for this are the reports of the Study programmes steering committees and reports of the Education and Student Affairs Committee. The bord handles the general appeals from students regarding specific courses and all other issues related to the operation of the study programmes.

All recommendations of the Study programmes Administration Board are presented to the Council of the Faculty of Engineering for final approval. The bord initiates and keeps international Cooperation with other universities.

2.1.2 Specific aspects of the study programmes

2.1.2.1 Design and approval of “Mechatronics Engineering and Automation Programme - MCTA” (B.Sc.)

2.1.2.1.1 General information

The mechatronics and engineering study programme was approved by Ministerial decree in 2014. The study programme's first mission was created in 2014, and it was reviewed using the faculty's approved mission review system. After polling faculty members, beneficiaries, and internal and external auditors, the study programme mission was updated in 2018. It was approved by the faculty council and study programme board on September 15, 2019, and work on it continues to this day.

The mission of the study programme is consistent with the mission of the accredited faculty, where the study programme follows the general mission set by the faculty. When the mission of the study programme is compared to the mission of the faculty, it is evident that the mission of the study programme perfectly aligns with the mission of the faculty, as both seek to produce distinguished graduates, satisfy market demands, and foster the growth and development of students' various skills.

With the study programme's launch in 2014, the study programme preparation team took part in defining and formulating its intended goals. The study programme is designed by faculty members and industry experts. The relevant scientific departments participated in the design of the study programme, are the department of automotive engineering, the department of mechatronics, the department of design and production engineering, the department of mechanical power engineering and the department of electrical power Engineering. As a result, the intended learning outcomes of the study programme were defined. The study programme development process was based on the actual needs of the community. The study programme was chosen based on actual societal needs to keep pace with the development in automatic manufacturing processes and production lines that rely on robots or study programmed machines as an essential element in the production line. In addition to the labour market's need for mechatronic engineers in research offices and development of many products. The study programme has been designed with a strong focus on one of the following areas: industrial automation, automotive mechatronics, medical engineering mechatronics, and nanomechatronics to keep pace with global developments to prepare engineers who can compete in local, regional and global markets.

The fulltime study programme adopted the goals of comparable initiatives around the world, and the goals were set using the same process as developing the mission. The goals were reviewed and updated in 2018. The study programme adopted the goals after the following:

- Reading and analysing the national academic standards document for the engineering sector
- Reading and analysing the document of the national academic standards for the engineering sector, specializing in mechatronics
- Reading and analysing the document of the national academic standards for the engineering sector, specializing in automobiles
- Analysis of the goals of similar study programmes internationally
- Holding a workshop for the team concerned with reviewing goals and discussing the results of the analysis of previous academic standards.
- Develop a first draft of the goals.
- Conducted a workshop with some faculty members and the supporting staff in the department on 11/21/2018.
- Based on the discussions that took place during the workshop, a preliminary version was reached on 22/11/2108
- The opinion of the beneficiaries was surveyed via e-mails in the initial format, and several personal interviews were conducted with the graduates of the study programme
- The results of the opinion polls were discussed on December 29, 2018, and the final version was reached.

The Mechatronics and Automation Engineering degree provides four different fields in which the students in this study programme can specialize. These four fields are: Autotronics, Nano-mechatronics, Industrial Mechatronics, and Bio-Mechatronics. Each concentration includes 5 compulsory courses as the following.

- Autotronics: The concentration is to incorporate elements of mechanical, electrical, electronics, software and safety engineers as applied to the design, manufacture and operation of automobiles.
- Nano-Mechatronics: the concentration is to how to integrate electrical and mechanical functionality on the nanoscale

- Industrial Mechatronics: the concentration of this area is to integrate control systems, electrical, electronic systems, computers and mechanical systems in automated manufacturing processes.
- Bio-Mechatronics: the concentration aims to integrate parts of biological organisms, mechanical elements, and electronics for improving the quality life of humans. It also encompasses the field of robotics and neuro science.

2.1.2.1.2 Objectives

Mission

The study programme's mission is to provide high quality education in the field of mechatronics, that support all mechatronics 's students in attainment their full potential to; compete in the local and regional market, deal with the latest developments in the field of mechatronics and automation systems, deal with the real problems in this field, conduct valuable research , provide specialized services for the community that will improve the environment, apply ethical standards and environmental considerations during implementing industrial and engineering projects. This is done by creating the appropriate conditions for developing the different skills, knowledge and attitudes of students essential for life-long learning.

Study programmes outcomes

In addition to the competences for all Engineering Study programmes (A-Level), the mechatronics and automation Study programme graduate must be able to:

- Synthesize and integrate mechatronic subsystems to create custom solutions for different engineering problems while dealing with technical uncertainties.
- Integrate a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline.
- Use computational facilities and techniques, measuring instruments, workshops, and laboratory equipment.
- Put the necessary specifications describing the different variants of mechatronic equipment such as Robotics, CNC machines, CAD/CAM systems, pneumatic and hydraulic equipment, etc. for purpose of purchasing and contracting.
- Write the necessary software for the equipment and the control of the mechatronic systems

- Competence in the safe use and operation of hand tools and machine tools that are used during the implementation phases of mechatronic systems.
- Distinguish the layout and the key parameters to the field of the concentration within the mechatronics and automation engineering as listed below.

Employability

The abilities that graduate of the Mechatronics and Automation study programme gain over the course of their years of study open the door to a wide range of career opportunities, both academically and in jobs related to the industry.

There is a broad range of businesses in the industry where graduates of mechatronics and automation engineering have completed internships and have been employed. ABB, BMW, LÒreal, Bosch Packaging, Danone, The Coca Cola Bottling Company of Egyt, Ford motors, Eva Pharma, Heidelberg Cement Group-Suez Cement Group, Mercedes Benz, Nissan Motors, Procter and Gamble, Siemens and so on may be mentioned as examples for companies.

From the exit survey, it was found that:

- 60% of the students applied for the job
- 27 percent received and accepted the job offer
- 56 percent of accepted jobs align with their studies
- 60% of students intend to pursue postgraduate studies

From the previous percentage, it can be conclude that this percentage is a good indicator of study programme performance.

2.1.2.1.3 Curriculum

The curriculum includes the total number of courses (NC): 63, the No. of 170 credit hours (CH) and 300 ECTS (European Credit Transfer System. The Student Workload (SWL) lies with 7450 and the Total Contact Hours (Lectures, Tutorials and Laboratories) are 280.

The student must also perform in practical field training for 12 weeks in industrial or service facilities**.**

Study programme levels and courses

The student status and the study levels depending on the number of credit hours that the student completed. Whenever the student has completed 20% of the graduation requirements, he will be transferred from one level to a higher level (0-4), it means from General to the first, the second the third and finally to the fourth. In Credit hours from 0 up to 170.

University Requirements

To achieve this goal, Ain Shams University has designed a number of courses planned to build the student's personality, develop his skills, and increase his awareness of different topics. These courses are called University Requirements. The Faculty of Engineering Ain Shams University has selected some of these courses to be offered within the Engineering Study programmes.

A placement test in English Language will be conducted for some admitted students to the Faculty of Engineering. If the student passes this test, then he will be exempted from taking the Technical English Language Course. The Technical English Language course is a prerequisite for all Faculty requirements courses.

For Language course, any non-English language is accepted including Arabic. If a student has an equivalent certificate, he is exempt from taking this course.

Faculty Requirements

To achieve these Intended Learning Outcomes, a set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses. A placement test in Mathematics will be conducted for all admitted students except some High School Degrees which are determined by the Faculty Council. If the student passes this test, then he will be exempted from taking the Basic Mathematics Course. The Basic Mathematics course is a pre-requisite for all Faculty requirements courses.

Specialization requirements

To get a Bachelor of Science Degree in this study programme, and to satisfy the Study programme Competences, the students have to complete a set of courses. Beside the Ain Shams University Requirements and the Faculty of Engineering Requirements the courses are structured in the objective areas of Mechanical Engineering Drawing, Industrial Automation, Logic Design, Power Electronics and Motor Drives, Thermal Power Engineering, Mechatronics & Automation Concentration Electives. Finally should each student finishes the two Mechatronics Graduation Projects.

2.1.2.2 Design and approval of “Energy and Renewable Energy Engineering Programme - ERGY” (B.Sc.)

2.1.2.2.1 General information

The study programme's first mission was created in 2009, and it was reviewed using the faculty's approved mission review system, then it was approved by Ministerial decree in 2009. Hence, bylaw 2007 was developed. The energy and renewable energy engineering study programme was approved by Ministerial decree in 2013. Furthermore, bylaw 2013 was further updated and bylaw 2018 was developed, accordingly. It was approved by Ministerial decree in 2018. It was approved by the faculty council on October 14th, 2019, and work on it continues to this day.

The mission of the study programme is consistent with the mission of the accredited faculty, where the study programme follows the general mission set by the faculty. When the mission of the study programme is compared to the mission of the faculty, it is evident that the mission of the study programme perfectly aligns with the mission of the faculty, as both seek to produce distinguished graduates, satisfy market demands, and foster the growth and development of students' various skills.

With the study programme's launch in 2009, the study programme preparation team took part in defining and formulating its intended goals. The study programme is designed by faculty members and industry experts. The relevant scientific departments that participated in the design of the study programme are the department of electrical power Engineering and department of the department of mechanical power engineering. As a result, the intended learning outcomes of the study programme were defined. The study programme development process was based on the actual needs of the community. The study programme was chosen based on actual societal needs to keep pace with the development in conventional energy and renewable sources energy industry, where it covers the energy studies from electrical and mechanical points of view. The study programme has been designed to provide a broader range of skills to the students with a specialization in energy generation and energy management. All topics under study prepare the study programme graduates for the national, regional, and international energy job market as well as enable the students to join any national, regional, and international master study programme.

The study programme adopted the goals of comparable initiatives around the world, and the goals were set using the same process as developing the mission. The study programme adopted the goals after the following:

- Reading and analysing the national academic standards document for the engineering sector
- Reading and analysing the document of the national academic standards for the engineering sector, specializing in energy and renewable energy.
- Analysis of the goals of similar study programmes internationally
- Holding a workshop for the team concerned with reviewing goals and discussing the results of the analysis of previous academic standards
- Develop a first draft of the goals
- Conducted a workshop with some faculty members and the supporting staff in the department on 11/21/2018
- Based on the discussions that took place during the workshop, a preliminary version was reached on 22/11/2108
- The opinion of the beneficiaries was surveyed via e-mails in the initial format, and several personal interviews were conducted with the graduates of the study programme
- The results of the opinion polls were discussed on December 29, 2018, and the last version was reached

There are two concentrations in this study programme:

- Power generation: This concentration focuses on the Power generation field taking into consideration conventional (thermal) and renewable energy (hydro, tidal, wave, wind, solar photovoltaic, concentrated solar power, biomass, geothermal …etc.), and waste conversion generating power stations. Power system analysis, stability, reliability, modelling, and advanced control are a core direction in this concentration. Graduates from these concentrations are qualified to join electricity utilities such as generation (public and private) and transmission entities. The graduation project could focus on the design and the evaluation of possible uses of renewable energies, power delivery systems analysis and control …etc.
- Energy management: This concentration tackles the energy management field that includes energy auditing, energy efficiency, clean energy technologies, and demand side management, taking into consideration power quality standards and economical aspects. This management as it is carried out is subject to international and national quality control, and quality systems and assurance methodologies. Renewable energies applications are studied such as: water desalination and distillation for industrial and residen-

tial activities, local production of energy in remote areas, energy storage …etc. Graduates from this concentration are qualified to work in electrical distribution systems' installations, design and operation of refrigeration and air conditioning systems, management departments of large projects/industries, distribution companies (public and private) …etc. The graduation project could focus on energy efficiency standard applications, wiring in distribution level, solar pumping, Power generation for domestic purposes and their impacts on power quality, compressor work requirements for cooling loads in air conditioning projects…etc.

2.1.2.2.2 Objectives

Mission

The mission of the Energy and Renewable Energy Engineering study programme is to provide education that is driven by a professional and technology-oriented focus and highly committed to sustainability. The study programme is devoted to educating and inspiring future generations of designers to be both technically skilled and ethically professional.

The Energy and Renewable Energy Engineering study programme is an interdisciplinary study programme that covers the energy studies from electrical and mechanical points of view. It aims to study both conventional energy and renewable energy sources. Students are provided with a deep knowledge of energy's flows, constraints, generation, transmission, distribution, consumption, and management through the period of study.

The Bachelor in Energy and Renewable Energy Engineering study programme degree offers many routes of career-progression for Energy engineers. The international bachelor's degree gives students an advantage in the employment market where the content of the study programme provides a broader range of skills to the students with a specialization in energy generation and energy management. All topics under study prepare the study programme graduates for the national, regional, and international energy job market as well as enable the students to join any national, regional, and international master study programme.

Study programmes outcomes

In addition to the competences for all Engineering Study programmes (A-Level), the Energy and Renewable Energy Engineering Study programme graduate must be able to (D-Level):

- D1: Model and analyse electrical power systems and electrical machines by applying energy systems concepts of generation, transmission, distribution and protection of electrical power systems;

- D2: Select, analyse and control appropriate driving systems for different energy applications;
- D3: Model, analyse and design energy systems by applying energy concepts of: Thermal-fluid Mechanics, solid Mechanics, Material Properties and processing, Measurements, Control Systems, Dynamics and Vibrations;
- D4: Design of mechanical energy systems using appropriate materials via both traditional and computer-aided tools;
- D5: Select proper mechanical equipment according to the required specification;
- D6: Adopt suitable standards and codes to design, build, operate, inspect and maintain mechanical energy systems;
- D7: Identify, analysis and evaluate the energy's conversion processes and management techniques;
- D8: Indicate and relate smart applications for energy systems; and
- D9: Test and evaluate the performance and suitability of energy systems.
- D10: Distinguish the layout and the key parameters to the field of the concentration as listed below
    - Power generation 10a: Distinguish the layout for Power generation stations and their related distribution networks.
    - Energy Management 10b: Distinguish and manage the energy demand for different applications to enhance their efficiency.

Career opportunities

This study programme qualifies its graduates to work in electrical power engineering, mechanical power engineering, energy and renewable energy engineering fields. Graduates can join electrical sector entities such as generation (conventional and renewable), transmission, and distribution companies either public or private. Power plants, control centres, petroleum industry, factories, maintenance applications, and energy management sectors can be a target for the study programme's graduates. Distribution installations, refrigeration and Air Conditioning, water desalination and distillation applications, and solar pumping fields are candidate jobs for the energy graduates.

Employability

The skills and competences that graduates of Energy and Renewable Energy Engineering study programme acquire throughout their years of study open the door for them to endless career opportunities either on the academic level or in industry-related jobs.

There is a broad range of companies in industry where the graduates of Energy and Renewable Energy Engineering study programme did their internship, are employed, and pursue their graduate studies. Some examples for companies are Abu Bakr Contracting, Al Futtaim real estate group, Al-Nasr Spinning, Weaving and Knitting Company, BIM Fundamentals for Engineer, Egypt for engineering industries, Egypt Railways, EgyptAir, Transit water stations like also Schneider Electric etc…

2.1.2.2.3 Curriculum

To get a Bachelor of Science Degree in this study programme, and to satisfy the Study programme Competences, a set of courses need to be completed. Beside the Ain Shams University Requirements and the Faculty of Engineering Requirements the courses are structured in the objective areas of Differential and Partial Differential Equations, Mechanical Engineering Drawing and Machine Construction and Design, Thermal Physics and Dynamics like also Heat transfer, Electrical Measurements, Industrial Electronics and Electrical machines, Power Electronics for Energy Applications. Each student has also to finish two Energy Graduation Projects.

2.1.2.3 Design and approval of Building Engineering Programme - BLDG" (B.Sc.)

2.1.2.3.1 General information

The building engineering study programme was approved by Ministerial decree in 2006. The study programme's first mission was created in 2006, and it was reviewed using the faculty's approved mission review system. After polling faculty members, beneficiaries, and internal and external auditors, the study programme mission was updated twice in 2013 and 2018 which were also approved by Ministerial decree No. (3043) and (4319) dated on 4/9/2013 and 18/9/2018 respectively.

The mission of the study programme is consistent with the mission of the accredited faculty, where the study programme follows the general mission set by the faculty. When the mission of the study programme is compared to the mission of the faculty, annex 16 it is evident that the mission of the study programme perfectly aligns with the mission of the faculty, as both seek to produce distinguished graduates, satisfy market demands, and foster the growth and development of students' various skills.

With the study programme's launch in 2006, the study programme preparation team took part in defining and formulating its intended goals. The study programme is designed by faculty members and industry experts. The relevant scientific departments that participated in the design of the study programme are the department of structural engineering, the department of public works, the department of architectural engineering and the department of mechanical power engineering. As a result, the intended learning outcomes of the study programme were defined. The study programme development process was based on the actual needs of the community. The study programme was chosen based on actual societal needs to keep pace with the development of structural and construction engineering to fuse between modern technology and traditional materials that allow the structural engineer to meet architects' modern design needs and challenges. The study programme has been designed with a strong focus on one of the following areas: structural mechanics and design, construction engineering, and construction management to keep pace with global developments to prepare engineers who can compete in local, regional, and global markets.

The study programme adopted the goals of comparable initiatives around the world, and the goals were set using the same process as developing the mission. The goals were reviewed and updated in 2018. The study programme adopted the goals after the following:

- Reading and analysing the national academic standards document for the engineering sector.

- Reading and analysing the document of the national academic standards for the engineering sector, specializing in civil and structural engineering.
- Reading and analysing the document of the national academic standards for the engineering sector, specializing in construction management.
- Analysis of the goals of similar study programmes internationally.
- Holding a workshop for the team concerned with reviewing goals and discussing the results of the analysis of previous academic standards.
- Develop a first draft of the goals.
- Conducted a workshop with some faculty members and the supporting staff in the department. Accordingly, a preliminary version was reached.
- The opinion of the beneficiaries was surveyed via personal interviews conducted with the graduates of the study programme and the Industry Advisory Board members.
- The results of the opinion polls were discussed, and the definitive version was reached by June 2018.

The Building Engineering degree provides three different fields in which the students in this study programme can specialize. These three fields are: Structural Engineering Design, Construction Engineering Management and Environmental and Sustainable Building Engineering. Each concentration includes a compulsory Pool of courses that the student needs to select from.

- Structural Engineering: Demonstrate additional abilities to select appropriate system, analyses, and design of Buildings using the most up-to-date tools of software study programmes.
- Construction Engineering Management: Demonstrate additional abilities to identify, formulate and solve a range of construction engineering problems such production and inventory, facility location, logistics, capital investment evaluation and resource allocation.
- Environmental and sustainable building engineering: Demonstrate additional capabilities to enhance life cycle sustainability of the buildings, building energy systems, taking advantage of climate and natural resources to develop passive design strategies and sustainable architecture.

2.1.2.3.2 Objectives

Mission

The study programme's mission is to provide high quality education in the field of civil engineering, that support all structural engineering students in attainment their full potential to; compete in the local and regional market, deal with the latest developments in the field of civil engineering, deal with the real problems in this field, conduct valuable research, provide specialized services for the community that will improve the environment, apply ethical standards and environmental considerations during construction engineering projects. This is done by creating the appropriate conditions for developing the different skills, knowledge and attitudes of students essential for life-long learning.

Study programmes outcomes

In addition to the competences for all Engineering Study programmes (A-Level), the Building Engineering Study programme graduate must be able to:

- Select appropriate and sustainable technologies for construction of buildings; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics and Fluid Mechanics.
- Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures, and Transportation and Traffic.
- Plan and manage construction processes; address construction defects, instability, and quality issues; and maintain safety measures in construction and materials.
- Deal with biddings, contracts and financial issues including project insurance and guarantees; and assess environmental impacts of civil engineering projects.
- Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.
- Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of structural design, construction, technology and engineering problems associated with building designs.

Career opportunities

Graduates of this department has a variety of opportunities to work, of the building engineering study programme, you will be qualified for positions at companies specializing in the design, analysis, operation, construction, and management of a wide range of residential, commercial, and industrial building projects.

The graduates can be found at numerous companies and organizations, for example:

- Government authorities,
- Consulting firms in civil engineering and construction,
- Civil engineering contractors and project managers,
- Environmental engineering organizations,

Employability

The abilities that graduate of the Building Engineering study programme gain over the course of their years of study open the door to a wide range of career opportunities, both academically and in jobs related to the industry. Here are a few examples of businesses in the industry where graduates of building engineering study programme are employed. There is a broad range of companies in industry where the graduates of Building Engineering study programme did their internship, are employed, and pursue their graduate studies. Some examples for companies are Arab Contractors, Dar Al-Handasah, Zuhair Fayez Consultants, Khatib & Alami, El-Hashimy Consulting Engineering Office, BIM VIDA Engineering L.L.C, AR DESIGN OFFICE, Ain Shams University, Kingston University, PETROJET - The Petroleum Projects & Technical Consultations Co. or also ENPPI - Engineering for the Petroleum Process Industries.

2.1.2.3.3 Curriculum

To get a Bachelor of Science Degree in this study programme, and to satisfy the Study programme Competences, a set of courses need to be completed. Beside the Ain Shams University Requirements and the Faculty of Engineering Requirements the courses are structured in the objective areas of Differential Equations and Numerical Analysis, Structural Mechanics and Analysis, Introduction to Structural Dynamics, Concrete Structures Design (1-3) and Construction Engineering, Steel Structures Design, Properties and Testing of Materials and the Concrete technology (1-2), Geology, Soil Mechanics (1-2) and Foundation Design (1-2), Construction Planning and Scheduling like also Surveying, Fluid Mechanics for Civil Engineers, Building Engineering Drawing, Building Envelope Design, Introduction to Lighting Systems, Thermal Analysis of Buildings like also Building Engineering Concentration Elective and finally should each student finishes the Building Engineering Design Graduation Project(1-2).

2.1.2.4 Design and approval of “Civil Infrastructure Engineering Programme – CISE” (B.Sc.)

2.1.2.4.1 General information

The Civil and Infrastructure study programme was approved by Ministerial decree in 2018. The study programme's first mission was created in 2018, and it was reviewed using the faculty's approved mission review system. It was approved by the faculty council on June 15, 2018

The mission of the study programme is consistent with the mission of the accredited faculty, where the study programme follows the general mission set by the faculty. When the mission of the study programme is compared to the mission of the faculty, annex 13 it is evident that the mission of the study programme perfectly aligns with the mission of the faculty, as both seek to produce distinguished graduates, satisfy market demands, and foster the growth and development of students' various skills.

The faculty council and study programme board both approved the mission's most recent update on June 15, 2018, respectively, using the following mechanism:

1. A workshop was held inside the faculty in which the study programme quality team participated on October 29, 2017
2. A workshop was held inside the faculty in which some faculty members participated on December 5, 2017
3. Based on the discussions that took place during the workshop, a preliminary version was reached on 6/5/2018
4. In the preliminary version, the opinion of the beneficiaries was polled via emails, and several in-person interviews with Industry Advisory Board members, as well as the opinions of internal and external reviewers, were conducted.
5. The results of the opinion polls were discussed on 15/6/2018 and the final version was reached.

With the study programme's launch in 2019, the study programme preparation team took part in defining and formulating its intended goals. The study programme is designed by faculty members and industry experts. The relevant scientific departments that participated in the design of the study programme are the department of Public Works, department of structure engineering department of irrigation and Hydraulics, and the department of Engineering Physics and Mathematics. As a result, the learning outcomes of the study programme were defined. The study programme development process was based on the actual needs of the community.

The study programme was chosen based on actual societal needs to keep pace with the development in Civil infrastructure field and optimization for infrastructure construction. In addition to the labor market's need for civil and infrastructure engineers in research offices and development of many techniques. The study programme has been designed with a strong focus on one of the following areas: industrial branch, construction field, infrastructure field, and optimization for infrastructure field to keep pace with global developments to prepare engineers who can compete in local, regional and global markets.

The study programme adopted the goals of comparable initiatives around the world, and the goals were set using the same process as developing the mission. The goals were reviewed and updated in 2018. The study programme adopted the goals after the following:

- Reading and analysing the national academic standards document for the engineering sector
- Reading and analysing the document of the national academic standards for the engineering sector, specializing in civil engineering branch.
- Analysis of the goals of similar study programmes internationally
- Holding a workshop for the team concerned with reviewing goals and discussing the results of the analysis of previous academic standards
- Develop a first draft of the goals
- Conducted a workshop with some faculty members and the supporting staff in the department on 5/12/2017
- Based on the discussions that took place during the workshop, a preliminary version was reached on 6/5/2018
- The opinion of the beneficiaries was surveyed via several personal interviews with Industry Advisory Board members.
- The results of the opinion polls were discussed on December 15/6/2018 and the final version was reached

Civil engineering today is concerned with the deterioration of the nation’s roads, bridges, water and power distribution systems, storm and sanitary sewers and other public infrastructure. The aim of the Civil Infrastructure Engineering Study programme is to graduate civil engineers responsible for the life-cycle of the system he creates and must be capable of optimizing the total system performance of large-scale public works projects, including their social and environmental impacts, in a way that addresses critical issues of infrastructure behavior, deterioration

science, and structural rehabilitation. On top of these fields comes surveying engineering, sanitary environment, transportation engineering, water-related engineering projects who can enrich the water resources and public works field.

- Transportation engineering: is concerned with moving people and goods efficiently, safely, and in a manner conducive to a vibrant community. This involves specifying, designing, constructing, and maintaining transportation infrastructure which includes streets, canals, highways, rail systems, airports, ports, and mass transit. It includes areas such as transportation design, transportation planning, traffic engineering, some aspects of urban engineering, queueing theory, pavement engineering, Intelligent Transportation System (ITS), and infrastructure management.
- Geomatics and Environmental Engineering: is the process by which a surveyor measures certain dimensions that occur on or near the surface of the Earth. Surveying equipment, such as levels and theodolites, are used for accurate measurement of angular deviation, horizontal, vertical and slope distances. With computerization, electronic distance measurement (EDM), total stations, GPS surveying and laser scanning have to a large extent supplanted traditional instruments. Data collected by survey measurement is converted into a graphical representation of the Earth's surface in the form of a map. This information is then used by civil engineers, contractors and realtors to design from, build on, and trade, respectively. Elements of a structure must be sized and positioned in relation to each other and to site boundaries and adjacent structures. Although surveying is a distinct profession with separate qualifications and licensing arrangements, civil engineers are trained in the basics of surveying and mapping, as well as geographic information systems. Surveyors also lay out the routes of railways, tramway tracks, highways, roads, pipelines and streets as well as position other infrastructure, such as harbors, before construction. Environmental engineering, emphasis is based both on the design of systems for water supply, water treatment, soil treatment, wastewater treatment, and waste management, as well as on the design of physical, chemical and biological unit operations and processes encountered in these systems.
- Water Engineering: is concerned with the collection and management of water (as a natural resource). As a discipline it therefore combines elements of hydrology, environmental science, meteorology, conservation, and resource management. This area of civil engineering relates to the prediction and management of both the quality and the quantity of water in both underground (aquifers) and above ground (lakes, rivers, and streams) resources. Water resource engineers analyse and model very small to very large areas of the earth to predict the amount and content of water as it flows into, though, or out of a facility. Although the actual design of the facility may be left to other engineers. Also

concerned with design of pipelines, water supply network, drainage facilities (including bridges, dams, channels, culverts, levees, storm sewers), and canals. Hydraulic engineers design these facilities using the concepts of fluid pressure, fluid statics, fluid dynamics, and hydraulics, among others.

2.1.2.4.2 Objectives

Mission

The mission of the Civil Infrastructure Engineering study programme is to prepare students to become qualified engineers who can generate effective solutions by using engineering approaches in the field of Civil and Infrastructure Engineering. The graduates of the study programme will be technically skilled and ethically professional.

Study programmes outcomes

In addition to the competences for all Engineering Study programmes (A-Level), the civil and infrastructure Study programme graduate must be able to:

- Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics and Fluid Mechanics.
- Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures, Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline.
- Plan and manage construction processes; address construction defects, instability and quality issues; and maintain safety measures in construction and materials.
- Deal with biddings, contracts and financial issues including project insurance and guarantees; and assess environmental impacts of civil engineering projects.
- Use the principles of engineering, soil science, biology, and chemistry to develop solutions to environmental problems. They work to improve recycling, waste disposal, public health, and water and air pollution control. They also address global issues, such as unsafe drinking water, climate change, and environmental sustainability.
- Demonstrate additional abilities related to the field of concentration within Civil Infrastructure Engineering as listed below.

Career opportunities

Our graduates are expected to have productive and very rewarding careers in a variety of capacities. The graduate of the study programme is expected to get a job in one of the following positions Government authorities, Consulting firms in civil engineering and construction, Civil engineering contractors and project managers, Water and sanitation utility companies, Environmental engineering organizations, Coastal engineers developing coastal environment systems or at the Water resources management authority.

Employability

The abilities that graduate of the civil and infrastructure study programme gain over the course of their years of study open the door to a wide range of career opportunities, both academically and in jobs related to industry.

In the following examples of businesses in the industry where graduates of civil and infrastructure engineering have completed internships: Arab Contractors, Hassan Allam company, Orascom and PETROJET - The Petroleum Projects & Technical Consultations Co.

2.1.2.4.3 Curriculum

The curriculum includes the total number of courses (NC): 63, the No. of 170 credit hours (CH) and 300 ECTS (European Credit Transfer System. The Student Workload (SWL) lies with 7450 and the Total Contact Hours (Lectures, Tutorials and Laboratories) are 270.

The student must also perform in practical field training for 12 weeks in industrial or service facilities**.**

To get a Bachelor of Science Degree in this study programme, and to satisfy the Study programme Competences, a set of courses need to be completed. Beside the Ain Shams University Requirements and the Faculty of Engineering Requirements the courses are structured in the objective areas of Structures and Properties of Materials, Properties of Electrical Materials, Structures and Properties of Construction Materials, Engineering Economy Elective like Engineering Economy, Renewable Energy Systems and Economics, Society and Housing Economics, Urban Economics and Engineering Economy and Investments- management and Finance. The last Elective courses are in the category of Project Management like Industrial, Software and Architecture Project Management Project so on Management for Electrical Engineering and for Essentials in Construction.

Study programme levels and courses

The student status and the study levels depending on the number of credit hours that the student completed. Whenever the student has completed 20% of the graduation requirements, he will be transferred from one level to a higher level (0-4), it means from General to the first, the second the third and finally to the fourth. In Credit hours from 0 up to 170.

2.2 Assessment

2.2.1 “Mechatronics Engineering and Automation” (MCTA)

The qualification objectives of the Mechatronics Engineering and Automation (MCTA) degree program are well-aligned, considering the ongoing penetration of digitalization and automation technology into all industrial and service sectors, reshaping the development and production of electromechanical products and components. On one hand, the program imparts a solid engineering fundament, such as mathematics, electricity, and magnetism, static and dynamics, automatic control, power electronics and motor drives, industrial communications, and networks. On the other hand, it facilitates specialization in various application domains, including mechatronics in automotive applications, mechatronics in healthcare and biomedical devices, and nano/micro mechatronic systems. The program also addresses significant technological trends like computer vision, computational intelligence, and industrial robotics, thus preparing students for a wide range of engineering career opportunities in the diverse sectors of mechatronics and automation technology.

The program design meets the necessary requirements concerning the defined entry qualifications and entry requirements. The course content includes, on the one hand, the compulsory mathematic, electrical and physical requirements for the desired qualification objectives, as is usual for comparable mechatronic and automation engineering degree programs and also in accordance with the recommendations for electrical engineering bachelor's degree courses of the VDE e. V. (German: Association of Electrical Engineering, Electronics and information technology). In this context, the course has defined a selection process for first-year students, which is coherent and adequate.

The qualifications and degree level of the program align with the qualification framework of equivalent European degree programs: this is derived on the one hand from the structure of the course and on the other hand from the module descriptions. This ensures that the required competencies and taxonomy levels at the bachelor's level are met. Furthermore, the course content, particularly the various application variants, corresponds to the program title "Mechatronics Engineering and Automation" and the degree "Bachelor of Science."

Personal development is appropriately promoted through seminars, project-oriented, soft skill modules and industry projects. The content of the program is highly transparent, with a clear division into university requirements to build the student's personality, faculty requirements involving basic science courses and basic engineering courses and specialization requirements to reach study program competencies.

It is commendable that the program places a strong emphasis on practical applications, as demonstrated by the selection of one of the possible application variants (e.g., Introduction to

Autotronics, Introduction to Nano-Mechatronics, and Introduction to Bio-Mechatronics). It is also positive, that the respective variants are introduced in introductory modules. The array of elective modules contributes to a more complex course structure but enables students to tailor their studies to their individual talents and interests. The expected student workload is sufficiently defined and transparent. The scope of the choices for the course and the variants depending on the variant, but is adequate for each specialization.

Necessary non-technical topics (e.g. Human Rights, Professional Ethics and Legislations) are also sufficiently represented explicitly as modules or implicitly through didactic concepts. Due to this technical/methodological “flexibility” and selection, the course concept can be assessed positively overall.

The necessary support, guidance, and examination-related procedures at the university are well-defined, including the practice regulation and the practice representative who assists students during their industrial project, among other things.

The teaching and learning formats described in both the module manual and the self-documentation are appropriate. The program explicitly includes projects, tutorials, laboratory practice and seminars that align well with the respective learning objectives of these modules. However, continuous development of didactic formats and examination methods is recommended.

Regular module and course evaluations involve students in the continuous improvement of the teaching and learning processes, as evidenced in discussions with the students. Only the choice of modules without overlap is not always given, which is particularly due to the elective modules. It is recommended to explore solutions for a semester structure without overlaps through continuous improvements in curriculum design and/or scheduling.

In summary, the bachelor’s degree program in Mechatronics Engineering and Automation offers an overall concept that facilitates continuous development and adaptation technological, managerial, and process-oriented developments in these specialized areas in the future.

The expert group would like to make some remarks for the further development of the program:

The amount of courses in industrial automation with plc could be expanded. Courses in advanced control theory could be added. A bachelor degree with 300 Credit Points is equivalent to a European master degree. The future curricula with 240 Credit Points are better adapted to he European system. To comply more with international standards, the graduation project should be given more Credit Points – if bylaws permit such a change.

2.2.2 “Energy and Renewable Energy Engineering – ERGY”

The Energy and Renewable Energy Engineering study program prepares students comprehensively for a job in the future field of renewable energy generation. This provides graduates with a wide range of job opportunities provides an application-orientated programme.

The advantage of the program is that it doesn't focus on purely technical subjects, but also includes energy management. In the technical area, the focus in the compulsory part is still very much on mechanical engineering - there could be more electrical engineering (e.g. theoretical electrical engineering). But the first semesters deliver a good base of fundamental knowledge. The Electrical engineering then only comes very nicely in the electives in the higher semesters. This qualifies graduates for various professions and activities in the mentioned sector. Experts for Energy generation play a major role in shaping the economy and the ecology with regards to the built and non-built environment.

According to the documents and interviews during the accreditation procedure graduates are well prepared to work in the local industry, mainly because of the many practice-relevant courses.

The expert group would like to make a recommendation for the further development of the program: the topic of “System controlling” should be implemented in the curriculum.

2.2.3 “Building Engineering Programme – BLDG”

The study programme Building Engineering Programme is part of the overall strategy of the Ain Shams University to be a higher education institution with graduates which competing in the labor market and community service in accordance with international developments. Graduates are well prepared to work in the local industry or the public administration, mainly because of the many practice-relevant courses. The study programme is designed by faculty members and industry experts, so the development process was based on the actual needs of the local industry. The students can specialize in three directions: Structural Engineering Design, Construction Engineering Management and Environmental and Sustainable Building Engineering. In each category they can select their courses. Sustainability had been part of the content and is still offered, but there is no interests of the students at the moment. It would be a necessary content for a Building Engineering study program which leads to future skills.

But it is still a good concept, to let the students chose their own way regarding to their own interests and skills. By the selection of the student also the general direction of the study program development is given. The bord can always see, which courses are most interesting for the students to meet their needs.

The workload with 300 ECTS (170 contact hours) seems to be suitable for reaching the goals of the study program and leads to a comparative exam regarding the ESG criteria.

Regarding the content it is remarkable that knowledge about architecture is not included in the curriculum. But it would be necessary for the students to get basic knowledge and abilities in this topic.

The Expert group would like to make a Recommendation for the further development of the programme: Architecture knowledge should be enhanced.

2.2.4 "Civil Infrastructure Engineering Study Programme – CISE"

The Civil Infrastructure Engineering Study Programme aims to produce experts in the field of infrastructure who will work for the state, for cities or for companies. This program thus makes an important contribution to the functioning and development of public space.

The curriculum covers all theoretical and practical areas and develops the skills required for these tasks. The workload seems appropriate to train the necessary knowledge and skills for later activities. The program also wants to achieve competences in social- and economic topics what is a very special approach. Also, the far range which includes surveying engineering and water related engineering provide a broad spectrum for the graduates. They would be able to combine different areas I their thinking for the tasks of the future in the field of Infrastructure. In this perspective the programme is well structured and aims of the future problems. For constructing infrastructure is could be helpful, to have fundamental knowledge in the area of architecture. Maybe it would be possible to offer basic courses in architecture and urban planning.

The Expert group would like to make the following Recommendation for the further development of the programme: An introduction in urban planning and architecture should be implemented in the curriculum.

2.3 Conclusion

The criterion is **fulfilled.**

3 ESG Standard 1.3: Student-centred learning, teaching, and assessment

Institutions should ensure that the programmes are delivered in a way that encourages students to take an active role in creating the learning process, and that the assessment of students reflects this approach

3.1 Documentation

3.1.1 Learning process

ASU strives to create an enabling environment conducive to meaningful learning in which students from all backgrounds are supported by committed and qualified staff. The FoE promotes an ethos of reciprocity, service and tolerance and is supportive of academically underprepared students, women, minorities, international students, disabled students, mature or working students and other underrepresented groups. The administration, communication, support services and curricula reflect, and value diversity and staff capacity and administrative infrastructure are sufficient to cater for the number of enrolled students so as not to compromise the student's support and developmental needs.

Students have sufficient access to technology to make it possible for them to successfully complete the study programme. Information concerning student support services is made accessible to all students. This is mostly facilitated through fully fledged IT laboratories, and free Wi-Fi facilities. Services such as learning support and additional tutorial support are made available at all phases of a students' journey: on first entering the institution; and to ease the transition from Higher Education into the world of work. Teaching and Learning support to all the learners are provided using all the physical resources available at *ASU* and provide such as online access to journals and databases.

The following summarizes the Learning and Teaching Policy at ASU:

- Student evaluation and assessment is based on final exams, midterm exams, quizzes, coursework assignments, course projects, presentations, papers, essays, in/out of class participation, portfolios, and many other innovative activities.
- Course instructors in the study programme are carefully selected from the distinct full-time world-class faculty members of the Faculty of Engineering at Ain Shams University.
- With the majority of courses being delivered over the entire year there is excellent scope for formative Assessment to stretch and extend the students. Thus, a key feature of the courses is the emphasis on formative feedback and guidance to enable students to develop a full understanding of the topics of study, prior to assessment taking place.

- Assessment for these study programmes takes the form of examinations, course works, presentations and time constrained assessments.
- Each course syllabus contains course objectives, textbook, outline, material, assessments, grading policy, and outcome. The outline should contain sections covered every week with reference to chapters/sections in the textbook. The instructor will give the course syllabus to the students in the first class. The syllabus serves as a contract between the instructor and the students.

3.1.1.1 Teaching form

Teaching/ learning methods/strategies used to enable the achievement of learning outcomes:

- Lectures
- Tutorials
- Laboratory
- Projects
- Self-learning

Lectures are the key method for introducing new material. They are presented to the whole group and are formal in delivery.

Tutorial sessions allow students to meet with their peers in small groups and focus on the practical application of their studies through problem-based classes and project work.

Laboratory is an additional educational component of a course in which the student can apply what he or she learned in lectures by using the lab's available facilities, which simulate the industrial field. Lab sections have smaller class sizes than lectures. In each lab there is a technician and teaching staff.

Projects are intended activities with specific goals and outcomes that have been used in some courses to improve participant learning and development. They are a collaborative process, frequently involving one or more teaching staff with students divided into small groups, that is carefully planned to achieve a specific goal of learning.

Learning will be supported through information on the LMS. The information on the LMS adds extra content and integrates additional resources.

In ICHEP there is an advising system used to help and enable students to better understand their own learning and to manage their education. Moreover, Unit Heads give careful consideration to ensure that students have access to their advisor.

Furthermore, each advisor is responsible for some of the instructors/courses in the study programme to see their progress each week and to facilitate any obstacle in online teaching, and

whether the instructor is capable of uploading all lectures, materials of the course on the learning management system (LMS) or not, if he can easily record videos to the students or not and the percentage of students who attend the quizzes and submit assignments on the LMS.

Finally, each advisor gives a weekly report on the course that he is responsible for (course monitor report) to the unit heads of the study programmes and then each unit head submits these reports to the vice Director for study programmes coordination and Academic advising and Director of the International credit hours engineering study programmes. If there is any problem or concern

regarding any course coming from the students or the instructors. The UHs and/or Academic coordinators set a meeting with the course leaders to solve the problem

3.1.1.2 Teaching method/ student-centred learning approach

At ASU, the teaching staff use a variety of techniques when designing the various courses that the student studies. Several of these techniques can be used in accordance with both teaching and learning strategies.

The Teaching strategy are the strategies used in the educational process in which the teacher is the focus in the educational process and the main source of information. The role of the student is limited to receiving only. This strategy is used to transfer knowledge only.

The Learning strategy are the strategies used in the educational process in which the student is the main focus in the educational process, as these strategies aim at self-learning resulting from what the student gets through his self-readings and his search for information, and the role of the teacher here is to help the student direct his performance.

3.1.1.2.1 Teaching Strategies

- Direct education: the lecturer (teacher/faculty member) in this method is considered the main source of knowledge. The role of the student is a recipient, as he relies entirely on the lecturer in receiving and preserving information, and attention is focused on knowledge outcomes such as facts, theories, and concepts. An example is the lecture.
- Lecture and Discussion: The lecturer (teacher/faculty member) in this medium plays an interactive role by involving the student in the educational process by urging him to express an opinion, expectation or inquiry in an attempt to maintain the student's attention, stimulate his mind and deepen understanding.
  Field visits: The lecture halls in this medium are replaced by a real environment related to the subject of the educational unit, which helps the student to link and match what he studies on the ground.

3.1.1.2.2 Learning Strategies

- Learning based on group projects: Participating in group projects as a way to learn fosters the growth of interpersonal skills such as teamwork, communication, debating opposing viewpoints, task organization, and team management.
- Learning based on group research: It is one of the means of learning through group work, by researching a problem or issue, and it aims to develop the skills of cooperation between members of the same group, dialogue and refutation of opinions.
- Brain Storming: is an educational method used to generate the largest number of ideas in the topic under discussion, where a topic is presented by the lecturer. Students present their ideas and suggestions, which are then collected and discussed to reach appropriate solutions.
- Writing reports/research: The lecturer asks the student to write report/research on a specific topic, and this method develops the student's research, analysis, expression, and presentation skills.
- Solving problems: The lecturer poses a problem, whether it is a real or hypothetical situation, asking for proposed solutions to it.
- Individual Projects: The lecturer proposes a project, asking for similar solutions and suggesting an additional solution in the form of a product or idea. This method develops students' critical, analytical and creative skills.
- Learning by Experimental Discovery: The lecturer asks the student to conduct experiments, whether field, laboratory or digital. This method develops students' analysis skills, mental deduction and action skills by tracking evidence.
- Self-study The lecturer selects a topic, asking him to study it in preparation for discussing it

3.1.1.3 Students with learning challenges

Students with learning challenges are accommodated as far as possible, taking the current College resources into consideration. The Academic Board is responsible for approving any recommendations made by the Student Counsellor to accommodate a student with any of the following learning challenges:

- A cognitive disadvantage which affects their ability to learn at the same rate as their peers.
- A specific learning difficulty which may or may not be linked to a cognitive disability

- A speech and language impairment affecting their ability to comprehend
- A physical disability and sensory impairment
- An emotional disability which can affect their ability to learn
- An extended period of absence which could occur for a variety of reasons
- A behavioural impairment affecting their ability to concentrate and therefore learn effectively
- Students who speak a different language at home than the one they speak at college

3.1.1.4 Equality and Diversity

The curriculum has been designed to meet the needs of all undergraduate students, of all ages, genders, or learning / physical disabilities. There is a strong emphasis on work-based learning. By using a full range of assessment techniques this enables students with different learning styles to be accommodated for. ASU has a policy of designing an inclusive curriculum where appropriate adjustments are made to the design, delivery and assessment process to cater for students with any learning difficulties. Teaching materials and module content have been designed to be inclusive addressing the needs of our diverse student body. Teaching methods include lectures, seminars, tutorials, discussions and workshops to address the needs of diverse learning needs.

3.1.2 Assessment of students' competencies

3.1.2.1 Assessment Policy

- Each course assessment will be designed and set in accordance with the course specification. This will state the number of components to be assessed as well as the weighting of each component. Each assessment will be moderated/verified internally at ASU. A marking criterion will be published to students using either a rubric or more detailed written explanation and will be provided to students at the same time as the assessment specification/task.
- The distribution of marks is left to the course designer to decide. It depends on the nature of the course. Some courses are theoretical, and therefore give more marks to the exams, and some courses are more practical and therefore give more marks to the projects, assignments and labs.
- Marking of assessments will use the full scope of marks, that is 0 – 100. A sample of 10% or 10 scripts (whichever is greater) must be second marked by ASU and this must cover the full range of marks. In the case of the research project (or similar work), the work of the entire cohort will be blind double-marked.
- Assessment tasks are designed to reduce, as far as is practicable, the possibility of plagiarism and collusion and other instances of academic misconduct.

The following is a non-exhaustive list of examples of academic misconduct:

- Plagiarism: representing another person's work or ideas as one's own, for example by failing to follow convention in acknowledging sources, use of quotation marks etc. This includes the unauthorized use of one student's work by another student and the commissioning, purchase and submission of a piece of work, in part or whole, as the student's own.
- Collusion: cooperation in order to gain an unpermitted advantage. This may occur where students have consciously collaborated on a piece of work, in part or whole, and passed it off as their own individual efforts or where one student has authorized another to use their work, in part or whole, and to submit it as their own.
- Misconduct in examinations (including in-class tests). Including, for example, when an examination candidate:
    - copies from the examination script of another candidate.
    - obtains or offers any other improper assistance from or to another candidate (or any other person unless an approved reader or scribe);

- has with them any unauthorized book (including mathematical tables), manuscript or loose papers of any kind, unauthorized electronic devices (including mobile telephones) or any source of unauthorized.
- allows himself/herself to be impersonated or when any person impersonates another examination candidate.

- Fabrication or misrepresentation: the presentation of fabricated data, results, references, evidence or other material or misrepresentation of the same. Including, for example:
  - claiming to have carried out experiments, observations, interviews or other forms of research which a student has not, in fact, carried out;
  - claiming to have obtained results or other evidence which have not, in fact, been obtained;
  - in the case of professional qualifications, falsely claiming to have completed hours in practice or to have achieved required competencies when this is not the case;
- Failure to obtain ethical approval: where work is undertaken without obtaining ethical approval when there is a clear and unambiguous requirement to do so.

ASU-FoE will use a range of mechanisms for determining academic misconduct including and not limited to, plagiarism software, internet searches, viva voce.

3.1.2.2 Assessment organization

The instructor is responsible for correcting and grading the exam paper. The corrected paper is sent to the control unit by the instructor after it has been corrected. The control unit announces the results after checking the results and printing the statistics. In the event of unusual statistics in any course, the grades are discussed in the education and students committee and appropriate action is taken.

ASU has four types of assessments: course activities, midterm, lab activity and final exam. The course activities (classwork) and their grades should be announced to students by week 15. Students should be informed of their midterm grade in week 9. The final examination grade should be announced within two weeks after the final examination.

3.1.2.3 Kinds of assessment

- The marks of each course are distributed as percentages of the total mark, divided into Course Activities, Mid-Term Exam, Practical Exam, pop quizzes and Final Exam.
- The student must attend at least 75% of all course contact hours to be allowed to attend the course final examination.

- For the student to pass a course, student must earn minimum 60% of the sum of all assessments with the minimum mark that must be earned in the final exam is 30% of the total final exam marks, otherwise the student will fail the course irrespective of the total marks he earned in the course, and he/she will get an F grade in this course. This clause does not apply to courses with no final exam.
- The distribution of the marks among different assessment criteria is determined in the course description of the Bylaw. However, the Faculty Council can modify the distribution for a course upon agreement with the concerned Department and announce to the students before the beginning of the semester.

The typical examination system consists of

- Course work (Major tasks) includes assignments, seminars, projects, and presentations. The total grade of course work should not carry weight more than 25% of the total course grade if quizzes, midterm, and final term exams exist
- Quizzes: A 10-20 minute exam or computer-based test that may be conducted before the mid-term and the final exam, according to the course requirements. Pop quizzes may be given from time to time. The total grades of the quizzes should not carry weight more than 10% of the total course grade, if course work, midterm, and final term exams exist.
- One Mid-semester exam that covers approximately half the course material. The grade of this exam should not carry weight more than 25% of the total course grade if quizzes, assignments, and final term exam exist.
- Final examination: is to be conducted during the last two weeks of every semester. The grade of this exam should not weigh more than 40% of the total course work if quizzes and midterm exam exist.

3.1.2.4 Feedback to Students

Feedback will be given to all students, especially on summative assessment tasks. Normally the teaching staff will choose how this is given, but generally it is given individually. Assessment feedback is provided to students so that they can use the feedback to improve their future performance. The students are also provided with feedback on formative tasks – that is tasks that do not lead to a final mark or grade. The lecturer or the module leader will determine how this is given.

Feedback is central to learning and is provided to students to develop their knowledge, understanding, skills and to help promote learning and facilitate improvement.

All feedback will be:

- timely (provided within 20 working days)
- given in relation to the learning outcomes and assessment criteria
- provided for both coursework and examinations.
- clear, relevant, motivating, and constructive
- developmental, enabling students to both consolidate learning and achievement.
- word-processed where e-submission is not used (unless the nature of the work prevents this e.g., mathematical formula)
- offered in a range of formats appropriate to the module e.g., electronically via Turnitin Grade Mark or other e-Submission tools where used, Audio file, Video file, or Screen cast.

3.1.2.5 Assessment Criteria

Marking criteria will be published to students using either a rubric or more detailed written explanation and will be provided to students at the same time as the assessment specification/task. This is applicable for course activities, mid-term exams and lab activities only. Examples of projects, lab marking criteria are given in annex 24

3.2 Assessment

In all four study programs, the teaching methods align with the common practices in engineering. The proportion of lectures, laboratory work, and tutorials appears adequate. The group sizes in tutorials, with up to 40 students, and in laboratory sessions are sometimes relatively large. Given the high number of students and limited capacity on the part of teaching staff, this is still appropriate.

The student-centered teaching at ASU places the learning process of the students at the center. The emphasis is on active rather than passive learning. Critical, analytical learning and independent knowledge production are also at the forefront. Students take responsibility for their own learning processes and outcomes.

In the higher semesters, there is an increasing focus on modules that employ project-based learning. These modules are particularly valuable for competency acquisition as students work independently and in a practical manner, creating design-related projects, for example. However, these modules are also notably intensive in terms of workload, and students often require more time to complete them. It might be worthwhile to consider ways to either reduce the workload of these modules or allocate a greater number of credit points to them.

One major challenge for students is the scheduling of classes at Ain Shams University, which stretches throughout the day. This can be quite taxing for the attention span of many students. Within the available options, the university should attempt to keep the timetables as compact as possible.

Moreover, many difficulties arise due to scheduling conflicts, especially with elective courses. The teaching staff is always striving to find solutions so that as many students as possible can attend lectures. Consequently, lecture schedules are frequently adjusted at the beginning of the semester. It would be desirable to proactively plan for possible overlaps in the scheduling of lectures during course planning to ensure systematically overlapping-free timetables.

Teaching evaluations are typically conducted twice per semester, at mid-semester and at the end of the semester. Evaluation forms are anonymous and are carried out online. The university places great importance on ensuring the participation of as many students as possible, and evaluations may be repeated if participation is too low. Regular teaching evaluations provide the teaching staff with an incentive to improve their teaching methods or reconsider the workload based on student feedback. Conversations with both students and the teaching staff have shown that feedback is genuinely used and has led to improvements in the past. In this way, students are provided with a meaningful opportunity to provide feedback to their professors.

The methods and criteria of assessment are clearly defined by the study regulations that are part of the bylaw. The articles 23 until 29 specifically define the assessment procedure. The assessment procedure is clearly described, and the examination process is transparent.

According to the evaluation panel's assessment, the examination forms are overall very suitable and variant in order to acquire the learning objectives and competencies to be achieved in the present degree programs. The students were very positive about the examination system, examination density and examination organization. The communication of examination dates and contents is transparent to the students. The examination dates are published in good time for the students. In the online survey, students stated that they felt well prepared for the examinations by the lecturers, that the workload of the examinations in both study programs was easy to manage and that they were informed of the examination dates in good time. The density of examinations is therefore appropriate, and a good distribution of examinations is ensured by the study plan. Exam preparation and organization are rated positively in the evaluations. The workload is described by the students as appropriate and manageable.

Examinations in all four study programs are relatively fragmented, with nearly every module having mid-term exams, end-term exams, student activities, and/or practical exams, often featuring three or even four different types of assessments for a relatively small number of credit points. This approach motivates students to gradually learn the content of each module throughout the semester. However, it should be noted that students find the workload for some modules to be quite high. To counteract this, it could be considered to eliminate some examination components that are of slightly lower significance for achieving the intended learning outcomes. The methodology, scope, and difficulty level of most examinations are considered appropriate.

Due to the variety of examinations with different formats, a wide range of competencies are assessed, and the examinations effectively assess whether students have achieved the intended learning outcomes for a given module. The level and form of the examinations are therefore rated positively.

3.3 Conclusion

The criterion is **fulfilled.**

4 ESG Standard 1.4: Student admission, progression, recognition, and certification

Institutions should consistently apply pre-defined and published regulations covering all phases of the student "life cycle", e.g. student admission, progression, recognition and certification.

4.1 Documentation

The ASU-FoE provides all necessary conditions and support for students to make progress in their academic career while studying at the university. During all phases from admission of a student until the awarding of a degree, predefined regulations structure and determine the student life cycle at FOE. These policies, admission processes and criteria are implemented consistently and in a transparent manner and are always accessible for the students.

Every year FOE revises and publishes application guidelines for the Bachelor and Master study programmes. These are supposed to help the applicants through the entire application process.

4.1.1 Study programme admission requirements

The admission requirements are provided every year at the faculty page which requires that the students with Egyptian Secondary education or equivalent certificate with major in Mathematics and/or equivalent diplomas may apply for admission/enrolment in the Credit Hours Engineering Study programmes after being accepted in the Faculty of Engineering (ASU) based on the rules yearly set by the Higher Council of Universities.

4.1.1.1 Enrolment Requirements and Scholarship System

The Faculty of Engineering, Ain Shams University is a Public University. It offers Higher Education in Specialized Study programmes for Free (Scholarship from the Government) based on the Egyptian Constitution. The students who benefit from this Free Education are those who have completed The Egyptian High School Diploma (Thanaweya Amma) or equivalent and enrolled to the Faculty of Engineering through the National Coordination Office in the same year of achieving this Diploma or equivalent. The student keeps his Free Education as long as he fulfils the conditions mandated by the Egyptian Laws for Universities and these Bylaws.

Students who are not enrolled directly to the Faculty of Engineering, Ain Shams University, through the National Coordination Office, but has achieved the minimum Engineering Sector requirement, can join the Inter-Disciplinary Study programmes paying the separate Tuition Fees decided by the Faculty Council every year.

Students who are enrolled directly to the Faculty of Engineering, Ain Shams University, through the National Coordination Office, can join the Inter-Disciplinary Study programmes paying the separate Tuition Fees. The Council of the Faculty of Engineering, Ain Shams University can award extra scholarships for students who have achieved a minimum GPA, or students with limited financial abilities, according to the rules announced by the Council every year.

The top Thirty students in the Egyptian High School Diploma (Thanaweya Amma – Mathematics Section), are fully exempted from paying any tuition fees if they join the Inter-Disciplinary Study programmes students. To maintain this exemption in the following semesters, the student should maintain a minimum GPA of 3.3 in every semester, otherwise the student will lose this privilege and the other rules will apply.

If the Free Education student fails to achieve a minimum Semester GPA of 2.0 for 4 consecutive main semesters, he can be exceptionally allowed to register courses for 2 more semesters paying the separate Tuition Fees decided by the Faculty Council at the year of registering the course.

If a student enrolled in any of the Specialized Study programmes fails a course two times, he is allowed to register this course again for 4 more times paying the separate Tuition Fees decided by the Faculty Council every year at the year of registering the course. Free Education students are allowed to register in the required courses to achieve the degree awarding requirements for his study programme. Any registered Credit Hours beyond the Study programme required Credit Hours for any reason are charged separate Tuition Fees decided by the Faculty Council every year at the year of registering the course. Free Education students can only register courses in the main semesters. However, they can register for courses in the summer semester paying the separate Tuition Fees decided by the Faculty Council every year at the year of registering the course. They have to register a minimum of 12 Credit hours every main semester.

Any student not enrolled to the Faculty of Engineering; Ain Shams University can register any number of courses paying the separate Tuition Fees decided by the Council of Ain Shams University every year at the year of registering the course. This student is given a Transcript of the courses he has registered in, showing his grades. By any means, he is not awarded a bachelor's degree from the Faculty of Engineering, Ain Shams University.

4.1.1.2 Placement Tests for newly admitted students.

The study at the Faculty of Engineering is in English and Mathematics is the basis of Engineering Sciences; therefore, the faculty has the right to test the candidates to check their English and mathematics proficiency. The Faculty Council can organize a placement test for the students enrolled to the Faculty in English and Mathematics. The Faculty Council can ask the

students who fail these tests to take zero credit courses in order to have equal opportunity with other students.

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

4.1.1.3 Tuition Fees for Inter-Disciplinary Study programmes

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

4.1.2 Student progression

4.1.2.1 Study Levels

Whenever the student completes 20% of the Study programme requirements (34 Credit Hours), he will be transferred from one level to the next (Level 0 to Level 4).

4.1.2.2 Terms of Course Registration

- The student may register courses in the main semesters with a maximum total Credit Hours according to the following rules (after approval of the Academic Advisor):
    - Up to 21 Credit Hours or 7 courses, whichever is greater for a student with a Cumulative GPA larger than or equal to 3.0
    - Up to 18 Credit Hours or 6 courses, whichever is greater for a student with a Cumulative GPA larger than or equal to 2.0, but less than 3.0

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

4.1.2.3 Course Grades

The GPA of each course is calculated based on the marks a student collects during his study of this course (Student Activities – Mid Term Exam – Practical Exam – Final Exam). The following table (**Fehler! Verweisquelle konnte nicht gefunden werden.**) shows how to calculate the GPA based on the collected marks. The student must get a minimum Grade D in order to pass the course and be considered in the calculation of the Cumulative GPA. The distribution of the marks among different assessment criteria is determined in the course description of this Bylaw. However, the Faculty Council can modify the distribution for a course upon agreement with the concerned Department and

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

4.1.2.4 Course Repeating

- The student can repeat a course for improvement if his grade satisfies the minimum passing requirement, according to the following rules:
    - The student gets the higher grade on the course after repeating. This grade is the one that will be accounted for in the cumulative GPA, on condition that the improvement should be shown in the student's transcript.
    - The maximum number of times that the student can repeat for repeating is five times during his study duration, except for improving courses with the purpose of getting out of the academic probation or satisfying the graduation requirements.
    - The student should pay the full credit hours fees for improving the course.
- If the student fails a course (gets F grade), he should repeat the course (full attendance and performing all activities including examinations), according to the following rules:
    - The maximum grade of the repeated course is B+.
    - The student gets the grade of the course after repeating. This grade is the one that will be accounted for in the cumulative GPA, on condition that the repeating should be shown in the student's transcript.
    - The student should pay the full credit hours fees for the repeated course.
- If a student repeats a course, he is required to repeat all course assessment criteria and will be completely re-evaluated. The course grade is calculated from scratch.

4.1.2.5 Study Dismissal and Academic Probation

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

graduation requirements, provided that he has successfully completed at least 80% of the total number of credit hours required for graduation and there is a chance for the student to raise his GPA to at least 2.0.

4.1.2.6 Declaration of Honour

- For a student to achieve the declaration of honour, he must fulfil the following conditions:
  - Maintain a cumulative GPA of 3.3 throughout his study at the Study programme and any semester GPA should be higher than or equal 3.3.
  - Does not fail any course throughout his study at the Study programme.
  - Did not get any penalty throughout his study at the faculty

4.1.2.7 Student Transfer between Credit Hour System and Semester-Based System

- It is possible to transfer students from another Engineering study programme with semester-based system (either inside or outside the Faculty of Engineering, Ain Shams University) to any of the study programmes in these regulations, according to the admission regulations in Part B.
- Course equivalence will be performed between the courses the student already passed in the Semester-Based study programme and the equivalent courses in the study programmes offered here.
- The following table is used to calculate the equivalent grades when transferring the student from the Semester-Based system to the Credit-Hour system.

4.1.3 Degree Awarding Requirements

- To obtain the Bachelor of Science Degree in Engineering, the student must successfully complete the required Credit Hours in one of the study programmes according to the requirements stipulated in Part D, with a GPA at graduation of at least 2.0.
- The student must pass all zero-credit courses in his Study programme.
- A graduation project is an essential part of all the study programmes requirements for graduation. The graduation project may be completed over two successive semesters, as per the study programme requirement, and the student will not graduate unless he fulfils the project pass requirements. The student must earn at least 130 Credit Hours to register for the graduation project. If the project is divided into two semesters, the student must register them in their order.

- The student must perform Field Training for 12 weeks during his study duration.
- The student can study a number of courses in another University which has a cooperation agreement with Ain Shams University regarding the transfer of Credits. This requires prior approval from the Faculty of Engineering, Ain Shams University. The Credit Hours of these courses are included in the student's graduation requirements, provided that the total Credit Hours of these courses do not exceed 68 Credit Hours

4.1.4 Students' performances over the years

The number of enrolled students in mechatronics and automation study programme (2021) is 600. It is obvious that the study programme has been in great demand since its inception and that the study programme has reached a steady state and the number of applicants is a satisfactory number.

Five graduated batches of the study programme have been graduated by 480 engineers so far. Where 49 students were graduated in 2017, 61 students in 2018, 140 students in 2019, 120 students in 2020. and 110 students in 2021, and the rate of increase in student numbers is an indication of the success of the study programme. Another indication of these numbers is the increase in the labour market's need for graduates of the study programme, and the demand of students for it.

4.2 Assessment

The admission requirements and process at Ain Shams University are clearly defined by the bylaw's articles 9 until 13. Prospective students have access to comprehensive information about the academic prerequisites, documentation, and deadlines for applications. The admission process is relatively complex due to the requirements of the Egyptian government and the peculiarities of the Egyptian education system. However, the admission process is very transparent.

Ain Shams University demonstrates an adequate system for collecting, monitoring, and acting on information regarding student progression. Extensive data is available in the areas of assessment and graduation, among others. However, this system could be further improved by collecting more data, for example on the average duration of studies, the weekly average amount of time spent studying or the number of students who drop out without graduating.

The recognition procedures at Ain Shams University that are defined in the bylaw are appropriate and confirm the Lisbon Recognition Convention. The institution recognizes and values higher education qualifications, periods of study, and prior learning in a manner that aligns with the principles of the convention. Students transferring from other institutions, whether domestic or international, can expect their prior educational achievements to be appropriately taken into account.

Students at Ain Shams University receive graduation documents that are sufficiently informative and comprehensive. These documents provide a detailed listing of the qualifications obtained. Furthermore, the documents provide a clear overview of the achieved learning outcomes, emphasizing the skills and knowledge acquired during the course of study.

4.3 Conclusion

The criterion is **fulfilled**.

5 ESG Standard 1.5: Teaching staff

Institutions should assure themselves of the competence of their teachers. They should apply fair and transparent processes for the recruitment and development of the staff

5.1 Documentation

5.1.1 General information about the FoE organisation

The organizational structure of the FoE (**Fehler! Verweisquelle konnte nicht gefunden werden.**) was approved by the Faculty Council No. 11 for the academic year 2014-2015, which was held on 16/11/2015; and various departments have also been approved. Updates are done according to the developments that may occur which require modifications or changes in the organizational structure. The Faculty of Engineering, Ain Shams University offers a variety of Engineering Study programmes. Each Study programme is administrated by a Study programme Steering Committee. The study programmes are divided into Specialized and Inter-Disciplinary Study programmes (ICHEP).

In ASU, at the specialized departments, the recruitment was done from the highest-ranking students with the class after that they got a scholarship for the MSc and Ph.D. Accordingly, each year the top graduates (accumulative grade) are offered teaching assistant positions at the faculty. Teaching assistants are expected to pursue their academic career and progress to professors.

However, in ICHEP there is a selection policy and selection committee from the all ASU staff as an example for the Unit heads, academic coordinators, advisors, and teaching staff.

The courses to be taught for each study programme in the ICHEP are announced to the specialized departments. The faculty members who are interested in teaching these courses complete a special data form. The ICHEP board selects faculty members whose academic specializations and fields of research are relevant to the course to be taught.

5.1.2 Criteria and Mechanisms for Selecting teaching staff:

- Faculty members apply to teach subjects on the website, and the selection is made based on the curriculum vitae, and the experience of the faculty member in teaching the course, and that he is in his exact specialty.
- The faculty member must present the specifications of the course to be taught as a procedural step for differentiation.

- The students' evaluation of the courses taught or co-taught by the lecturer, whether in study programmes or in the semester system, is taken into consideration.
- Commitment to the dates and places of teaching courses sent by the Study programme Department.
- Diversity of the distribution of lecturers as much as possible on the different courses.
- The necessity of having an email for each lecturer (@eng.asu.edu.eg)) to deal with the new information system for the credit hour study programmes.

The faculty members lead and contribute to the courses related to their scientific expertise, and a plan is developed in the case of a deficit in any necessary specialization or expertise. Professor, associate professor and lecturer have a max16 teaching hours/week

5.1.2.1 Staff development

For ASU-FoE, regular staff development training is offered by Ain Shams University Training and Development Center (TDC). In addition, several staff developments sessions were given by the Teacher Support and Development Centre (TSDC) at ASU-FoE during the Covid period (Annex 28)

5.1.2.2 TDC

TDC is affiliated with the Post-graduate Studies Sector at Ain Shams University. TDC was established in 2005 to develop the skills of the senior and junior faculty and leadership. The Center is internationally certified from the International Board of Certified Trainers. TDC offers various study programmes in several fields given by distinguished internationally certified trainers from faculty members. The Centre’s activities have been widened to reach the local and international community. For more details, please visit https://tdc.asu.edu.eg/

5.1.2.3 Teaching Support and Development Centre (TSDC)

It gives support and guidance to all the staff in the Faculty of Engineering. Moreover, it prepares and runs staff development workshops as the TSDC objectives are as the following:

- Preparing seminars for the teaching staff
- Contributes to the call for and/or the preparation of workshops
- Preparing the training material for a workshop on developing engineering education
- Publishes videos on YouTube channel that include considerations, notes, and ideas for the teaching system to help instructors in the online learning system and online evaluation

Also, TSDC has made a YouTube channel for publishing tips & tricks concerning enhancing Engineering Education, Sustainable Development Goals and Engineering, and events hosted by TSDC. The URL for this channel is as follows:

https://www.youtube.com/channel/UCTyN26YoE2xwjD6mBO6m2eQ/about

Moreover, TSDC in collaboration with the Center of Excellence for Energy (*CoEE*) and *MIT* conducted online Zoom sessions to explore the "COVID-19-Distruption and its Implications for Education".

5.1.3 Teaching staff of the study programmes

5.1.3.1 Teaching staff of MCTA.

Different resources are needed to implement the objectives discussed above. One of them is the teaching staff. Currently, Faculty members participating in the mechatronics and automation study programme are 74 staff members (36 Ph.D. holders and 38 Teaching Assistants, all of them are ASU graduates).

Additionally, professors from the basic science and humanities departments, teach the basic science courses (Math, Physics, Chemistry) and humanities courses (including Scientific Methods courses and German Language). The current teaching staff male/female ratio is 7:1, the student/teacher ratio (MCTA) is: 24: 1.

5.1.4 Teaching staff of CISE

All recruitment and selection procedures and decisions reflect the institute's commitment to providing equal opportunity by assessing all potential candidates according to their skills, knowledge, qualifications, and capabilities. No negative regard is given to factors such as age, gender, marital status, race, religion, physical impairment, or political opinions. Moreover, a reviewing selection committee ensures the technical suitability and standard of each appointed instructor reflecting quality standards in the teaching environment. '

5.1.5 Teaching Staff of BLDG

As BLDG study programme is an interdisciplinary study study programme, the academic staff teaching in the study programmes are from six scientific departments at *ASU-FoE* (Structural Engineering, Public Works, Water Engineering, Architectural, Mechanical Power Engineering, and Engineering Physics & Mathematics). Foundation year is taught by staff members from Engineering Physics and Mathematics department, while the following four study years are

taught by staff from Structural Engineering, Public Works, Water Engineering, Architectural, and Mechanical Power Engineering departments. Lists the staff members teaching in BLDG study programme is found in Annex 32

5.1.6 Teaching staff of ERGY

At the ERGY study programme, all instructors are hired from the electrical power and mechanical power engineering departments via semester-based contracts. The teaching staff for the ERGY study programme is shown in Annex 33

5.1.7 Research activities

The FoE's research profile is based on the formation of several research groups. Each group has its own research track. Members of each group can collaborate with other researchers in Egypt and abroad. Please visit https://eng.asu.edu.eg/research/635881 for research track for more research activity.

5.2 Assessment

The Ain Shams University has a staff policy that is clearly defined, and its procedures are publicly available and implemented. The teaching staff of the university is composed of highly qualified and experienced professionals who are committed to providing quality education to students. The institution's recruitment process ensures that only the most qualified and experienced individuals are selected for the teaching staff. The motivation of the teaching staff and the spirit of optimism can be clearly felt at all levels of the university. Faculty members are committed to creating an engaging, interactive and student-centered learning environment. They use a variety of teaching and learning methods, including lectures, discussions, case studies, group projects and experiential learning, to ensure that students can engage with the material and apply what they have learned in real-life situations.

The application and selection processes seem to be efficient and meaningful.

The evaluation procedures of research and teaching personnel are sound and efficient as well.

The university pays attention to well-qualified employees. According to the rectorate, vacancies can be filled well. The university has a choice between applicants. The motivation to apply in Oman is more heterogeneous than in Europe. Often roots in the country or relationships play a role. Therefore, many people from Africa and India apply.

The faculty members have the appropriate qualifications for teaching and where possible for research. There is a clear distinction between professors and lecturers, where lecturers do not have big opportunities for research. This somewhat makes it hard for lecturers to keep up with latest developments and trends in the various fields of science. It seems that it is difficult for lecturers to advance to research positions. There are no clear perspectives for lecturers. The ASU could provide a remedy here in the future.

5.3 Conclusion

The criterion is **fulfilled.**

6 ESG Standard 1.6: Learning resources and student support

Institutions should have appropriate funding for learning and teaching activities and ensure that adequate and readily accessible learning resources and student support are provided.

6.1 Documentation

Institutions provide a variety of resources to aid student learning for a higher education experience. These range from physical resources like libraries, teaching rooms, and IT infrastructure to human support like unit head, study programme coordinator and advisors.

6.1.1 Physical resources

6.1.1.1 Laboratories

Learning is never integrated without practicing, so providing our students with laboratories that serve all studying fields was one of the most important steps towards proper interactive learning. Currently, the *ICHEP* study programme has several laboratories for engineering students' experiments through the educational year. There are labs for undergraduate studies and advanced labs for postgraduate studies and research.

The available labs are as follows:

1. Mechatronics Engineering Lab.
2. Motion control Lab.
3. Hydraulic and Pneumatic Lab.
4. Automatic control Lab.
5. Computer study programming Lab.
6. Control system Lab.
7. Embedded system Lab
8. Siemens Lab.
9. Logic and control circuit applications Lab.
10. Fluid Mechanics laboratory
11. Properties of Materials laboratory
12. Soil Mechanics laboratory

All labs are designed to accommodate 25 students per class, at maximum, and equipped with advanced lab kits that are connected to personal computers to allow the lab instructor to perform different levels of experiments according to the level of the course.

The number of computers available to students is about 600 modern machines. A suitable number of computers are available for faculty members in their respective laboratories and offices in different sections. The number of computers available to employees is 250 devices. Computer labs are run centrally for students. The method of using these labs has been adopted by setting a nominal fee of not less than two pounds per hour to use the central labs which are open to access the network, while the student does not bear any burdens to enter the laboratories associated with the ministry while the Income is suitable for the maintenance and modernization of computers in college. The databases and information systems of faculty staff members, their assistants, students, graduate students, expatriates, administrators and libraries have been developed and updated. The databases are continuously updated.

The labs are also designed with virtual lab classes for lecturers and students in studying, practicing, team working and doing student projects. In addition, these labs could be used for either examinations, thesis preparation or project assignments.

There is also, a cooperation agreement was made with Tianjin University of China, which resulted in donating advanced technical equipment workshop called Luban workshop.

The study programme board periodically reviews to determine the material facilities required to support the study programme and to address the faculty board to provide them or include them in the faculty plan if necessary. The faculty enhances the computer laboratories annually by supporting some of the specialized computer equipment and study programmes that serve all the students of the institution, including the students of the study programme.

The computers have a variety of licensed engineering software installed to assist the students in running simulations relevant to their studies.

6.1.1.2 Teaching room

All the teaching halls of the institution are suitable for the educational process and are equipped with the latest teaching aids required for teaching, including projectors, display panels and means of internet .communication.

6.1.1.3 Library

The library at the Faculty of Engineering, Ain Shams University, which contains around 44500 books and 9750 theses that serve both the students and faculty staff, is a scientific, cultural and educational pillar that collects, organizes, retrieves and presents it to the beneficiaries of

students and researchers by providing a range of traditional services such as lending, photo-copying, and digital research provided by qualified scientific and technical competencies in the field of library and information sciences.

The library facilities consist of Sources of references and books, Master of Science and Doctor of Philosophy theses, and search service using electronic Library database. The library infra-structure consists of five halls: Student library hall, Scientific theses hall, Digital library hall, Staff library hall, and Donated books hall. All halls are covered with suitable environment for frequented by good furniture, ventilation, and Wi-Fi.

The library services are classified into:

- Service of looking at books and scientific theses using available hardcopies or through using available software versions on the private database of the Faculty of Engineering, Ain Shams University, which is classified into departments and then arranged by title and the date of publication or Federation of Egyptian Universities Libraries: (eulc.edu.eg) or Egyptian Knowledge Bank: (ekb.eg).
- Borrowing books service.
- Copying and printing service for digital theses and previous exams for students.

Arabic and foreign references related to the study programme are available, and they are constantly updated annually through the budget prepared for the purchase of books at the faculty and at the request of the teaching staff. Many magazines and periodicals that are browsed for free are also benefited through the website of the information bank provided by the Central Library, as they are available to students as well as faculty members and the supporting staff. The electronic browsing service is also available through the website of the Data Bank (provided by the Central Library), which contains many magazines and periodicals that are browsed free of charge for faculty members, the supporting staff and students.

The library's reference and periodicals list are updated on a regular basis. Each study programme department is required to prepare a list of references that are included in the course specifications for all courses in the study programme. It is considered to update these references in the course specifications so that they do not exceed a specific period that has been approved by the faculty's quality system for a period of ten years. To take the necessary steps toward providing these references electronically or in hard copy through the annual budget prepared for book purchases, which is approved by the faculty Council, and to update the electronic databases for electronic references on an annual basis.

6.1.2 S**upport services for the study programme**

All departments specialized in the college, including exams administration, faculty affairs, student affairs, finances, maintenance, and medical administration are entrusted with providing the necessary support for the study programme.

- IHUB Center
- Career Center
- MEU Center
- Performance appraisal center
- Quality unit
- Alumni Center
- E-Learning Center
- Center for People with Special Needs
- International Cooperation Center
- Project Center
- TDSC Teacher Development and Support Center

The departments which are responsible for providing technical support for the study programme are:

- Student Affairs Department
- Department of Financial Affairs and Accounts
- Information Systems Affairs Department
- Exam administration
- control management
- Medical Administration

Student Affairs Department

- Receiving the files of new students
- LMSData entry by the Unified Student Affairs study programme on the
- Reviewing and approving the data of those enrolled in the study programmes
- Modification of students' personal information
- Making enrolment certificates and transfers for students to and from the college

Financial Affairs Administration

- View the statistical data on the financial transactions of the study programmes

- Reviewing the financial statements entered by the accountants
- Record receipts for payment of tuition fees and fees for various services in the study programmes
- Adding the discount scheduled for some students and reviewing it according to the regulations
- Preparing rewards for various activities in the study programmes

And the others are Information the Systems Affairs Department, the Exams administration, the Control management and the Medical Administration.

The faculty board can modify some of the competencies of these departments according to the variables, such as what happened during the Corona pandemic where the medical department was assigned to follow up on suspected cases of the Corona virus and transfer them to the Student Hospital and Ain Shams Hospitals in cases of suspected infection with the virus

6.1.3 IT and data base

There are databases for the study programme through a central electronic system that serves all the study programmes of the institution and is included within the faculty system on the faculty website LMS-SIS Where all data is uploaded to the site related to the teaching system. All data and periodic announcements of exam schedules and course registration dates are also uploaded. Previous exams and student assessment grades are also uploaded to be available to students.

The electronic system that contains databases is flexible and is updated periodically and in emergency circumstances, as happened in light of the spread of COVID19 disease, the curricula have been completed by the distance education system with all the courses of the study programme through the faculty's e-learning platforms LMS and the faculty's channels on YouTube. On the LMS, a team was created to follow the faculty members carry out the required tasks and give the necessary technical assistance in view of the creation of new tasks and assignments that are not typical in teaching.

The IT members update the databases periodicity according to the nature of the data, where announcements, teaching schedules and exams are entered as soon as they become available, while the data of study programme and course students are updated every semester, and the data for course files are uploaded twice annually (the semesters).

All information about the study programme is available on the faculty website through a security system that guarantees access to information according to the level of security of the information seeker. For example, all visitors to the college website can access general data such as the biographies of the faculty members and the supporting body, and the introduction of the faculty departments and study programmes. While the availability of course content is limited to students registered on the required course. The display of evaluation scores is limited to each student, whereas the display of evaluation of a faculty member's performance is limited to the member assigned to and some members of the Performance Evaluation Unit in the Quality Unit. As for students, they can get their own information such as exam timings and all the data shared by both the faculty member and the students, and this is done using the official email of each student and faculty member SIS. As for the other confidential data, it is uploaded through the faculty member's email, which is only allowed to be circulated through the LMS faculty members.

The information preservation system contributes to ease the speed of archiving and recalling files. The study programme also supports the electronic upload of course files and the mechanism for reviewing course specification by the study programme 's quality team and faculty members. Several meetings were held with faculty members to discuss the mechanism of activating the electronic system for receiving course files.

6.1.4 Financial resources of the study programme

The study programme is financed through the tuition fees paid by the students participating in the study programme in accordance with the regulating laws through the faculty budget allocated through the Ministry of Finance.

The annual funding available is sufficient to achieve the study programme's mission and objectives. Even though the Ministry of Finance's funding sources are insufficient and require additional support, the faculty board has developed a plan to determine items and sources of spending to carry out a plan for the development and increase of the institution's self-resources through additional sources.

Where the required funding is completed from non-fixed sources of self-financing through the additional sources like the centre Consulting and research, the units self-character (private sector), the Obtaining in-kind support through donor institutions and the obtaining research projects funded by internal and international parties

The ICHEP board determines the priorities of the budget items allocated to the study programme based on controls approved by the faculty council. Where requests from various faculty study programmes are collected, in addition to the needs of the administrative apparatus,

and requests received from the faculty's specialized technical departments regarding central needs such as infrastructure development and maintenance work. The institution's specialized committees determine the priorities of budget items based on the priority classification of requests. The faculty budget is prepared annually after determining the allocations received from the Ministry of Finance, specifying the volume of cash flows expected to be supplied to the institution, and specifying a time frame for these flows.

6.1.5 Student support

ASU strives to create an enabling environment conducive to meaningful learning in which students from all backgrounds are supported by committed and qualified staff. The FoE promotes an ethos of reciprocity, service and tolerance and is supportive of academically underprepared students, women, minorities, international students, disabled students, mature or working students and other underrepresented groups. The administration, communication, support services and curricula reflect, and value diversity and staff capacity and administrative infrastructure are sufficient to cater for the number of enrolled students so as not to compromise the student's support and developmental needs.

Students have sufficient access to technology to make it possible for them to successfully complete the study programme. Information concerning student support services is made accessible to all students. This is mostly facilitated through fully fledged IT laboratories, and free Wi-Fi facilities. Services such as learning support and additional tutorial support are made available at all phases of a student's journey: on first entering the institution; and to ease the transition from Higher Education into the world of work. Teaching and Learning support to all the learners are provided using all the physical resources available at *ASU*.

6.1.5.1 Local arrangements for academic and pastoral care for students

- Study programme teams must ensure that Academic Advisors have the knowledge and skills to carry out the role. The role includes helping students to understand:
    - The academic and related skills required for successful study at CHEP.
    - The need for self-direction and responsibility for own learning.
    - Their learning needs beyond their current courses and immediate assessments.
    - An opportunity to identify areas of weakness.
    - Where to find information, help and support.
    - Clarification of aims and choices for progression, employment, and further study [internship]

- Academic Advising in *ASU-FoE*:
  - Must exist for every year.
  - That it must form part of the student induction process especially for General Level Year Students.
  - Must be used as a mechanism to identify "At risk students".
  - Must happen at critical moments in each semester. [week 1 & 8]
- Study programme teams must carefully manage the Academic Advising system so that students understand its role and know how to access it.
- Academic Advising needs to be carefully managed with its importance being emphasized:
  - During the induction period for each Level of the study programme.
  - In student handbook.
  - By Academic Advisor
  - By Course Instructors-via class announcements
  - Via email and SIS.
- Unit Heads agree procedures and systems to manage Academic Advising. These will include:
  - Allocation of Academic Advisors for all Levels
  - Ensuring student is informed
  - Delivery of Academic Advising
  - Identification of students at risk

6.1.5.2 Local Careers Advice

- Study programme teams must ensure that staff acting as Academic Advisors are aware of relevant learner support services.
- Academic Advising is only a part of Learner Support:
  - Employability Skills (through events)
  - Students Activities
  - The library
  - Disability issues

- The Student Union

- Employability and Career Development Centre (ECDC) is a Centre constructed through the collaboration between Ain Shams University and the American University, it has a permanent headquarter in Faculty of Engineering and another headquarter in Ain Shams University. It provides special training study programmes for students in order to develop their capabilities in the professional and employment fields. The center aims to guide the trainee to his excellence and weaknesses points, and how to raise points of excellence and overcome weaknesses.

6.1.5.3 Local arrangements for supporting students with disabilities/dyslexia

- The Faculty of Engineering provides support and equal learning opportunity to its diverse community, especially those with disabilities. The faculty aimed to provide an equal learning environment to experience the same level of equality and meet the same level of academic potential. The objectives are:
  - Ensure the accessibility to all faculty facilities
  - Ensure that admission requirements do not hinder anyone from enrolment by un-necessary barriers
  - Encourage people with disabilities to attend admission courses by providing any possible support.
  - Determine the needs of the disable and support staff to deal with their needs
- This is through a student disability services unit. The student should fill in the form describing his/her conditions to request disability services.
- According to each case, the unit can provide:
  - Quiet areas for exams equipped with the required physical changes
  - Providing staff members assisting for writing in exams
  - Extra exam time
  - Extended deadline for the assignments and attendance
  - Providing special seating place in class
  - Providing large print hand-outs, verbal description for visual aids

6.1.5.4 Other local resources relevant to supporting the study programme

- The faculty offers students Training Support through Global Training Technology Centre. It aims to be a center for innovation in technology and entrepreneurship, to form a link

between academic study and labor market. The center offers training study programmes to serve students and graduates at the same time, these training study programmes aim to develop the creative sense of the trainees in order to integrate them into creative and innovative works that would serve the industrial field and the community. Depends on the overlap between the different disciplines in various fields and at various levels. The center is nearly 1000 m² area, it works as the headquarters for the students to practice their activities in the future, and the college is preparing the headquarters of the center to accommodate the necessary training activities.

- The Faculty of Engineering has a website through the main website of Ain Shams University. The website is: https://eng.asu.edu.eg/. The website provides various services for students and faculty members by presenting the internal regulations of the bachelor's degree course as well as higher education. The site is being developed and data recorded within it is consistently updated. The contents of the various educational materials are displayed. The course schedules and exam results are announced at the end of the semester. The site is available in Arabic and English so that the user can choose the appropriate language. This site is regularly updated by site administrators and college administration. E-mail access is also available to the faculty members and the assistant staff and the students on the website of the College.

In order to update the educational services to the international standards, an online portal was developed in order to open access to students and staff members to perform efficiently online. Students can view their courses, submit coursework and view their grades. Staff members can upload their lectures, view the online submissions and grade online. An information technology unit was set up for the electronic portal of the college to be the main focus of interaction between students and faculty.

6.1.6 Learning resources and student support of MCTA

Learning is never integrated without practicing, so providing our students with laboratories that serve all studying fields was one of the most important steps towards proper interactive learning. Currently, the Mechatronics and Automation Engineering Department has several laboratories for engineering students' experiments through the educational year. There are labs for undergraduate studies and advanced labs for postgraduate studies and research.

The available labs are as follows:

1. Mechatronics Engineering Lab.
2. Robotics control Lab.
3. Hydraulic and Pneumatic Lab.

4. Computer study programmeming Lab.
5. Control system Lab.
6. Embedded system Lab
7. Siemens Lab.

All labs are designed to accommodate 25 students per class, at maximum, and equipped with advanced lab kits that are connected to personal computers to allow the lab instructor to perform different levels of experiments according to the level of the course.

6.1.6.1 Mechatronics Lab 1

The Mechatronics Lab has been established in the duration from of Sep. 2005 - Sep.2008 throughout funded Tempus project. The Lab provides students with software training sessions and Hands-on experience on different development kits and projects. The Lab acts as a platform for Mini-projects and Graduation Projects design, implementation, testing and validation.

Mechatronics Lab Facilities:

- DSpace
- PIC Micro controller Development Kits
- LG PLCs units
- Oscilloscopes
- Function Generators
- Measurement Kits

The Automatic Control Lab acts as a platform for graduation projects implementation. The lab encompasses several and different facilities and devices such as:

- Mobile Robot
- 6 DOF Hydraulic Stewart Platform
- ABB Robot (IRB 120)
- CRS Catalyst Robotic Arm

6.1.6.2 Hydraulic and Pneumatic Lab.

Pneumatics and hydraulics are both applications for fluid power which are used to run different kinds of actuators. They are widely used throughout industry in many applications. In *ASU* mechatronics department there is a pneumatics and hydraulics lab. that serves the material studied by the students in Pneumatic & hydraulic control courses.

The lab has the following facilities:

- Festech hydraulic kit.
- Research hydraulic kit.
- Pneumatic learning kit.

6.1.6.3 Control lab

The Control lab is used to teach students about Automatic Control and Feedback Systems. The lab is equipped with the Procon kits for Flow Control and Temperature Control. These kits have built-in PID controllers that can be easily tuned manually or automatically to show the students the response of Closed loop systems to different controllers with different gains.

6.1.7 Learning resources and student support of BLDG & CISE

There are four laboratories in four different rooms, which are equipped with modern technology and software that fulfils all teaching and studying requirements for all the students of the BLDG & CISE study programme. The primary purpose of BLDG & CISE labs is for teaching, study, examination, and class assignments. BLDG & CISE laboratories facilitate research, training, and collaboration on innovative technology and good management practices for the building industry. BLDG & CISE labs are equipped with modern machines, tools, types of equipment, and technology.

- Surveying laboratory: a general lab for all BLDG & CISE students, this lab is equipped with high technology equipment such as (Total station, levelling apparatus, Theodolite, ….) This lab has also installed software that meets the requirements of the study programme modules.
- Fluid Mechanics laboratory: a general lab for all BLDG & CISE students, mostly used for teaching fluid mechanics courses; this lab comprises the experiments of flow through Venturi-meter and flow through a circular orifice, and rectangular/V-notches.
- Properties of Materials laboratory: a general lab for all BLDG & CISE students; mostly used for teaching concrete technology and building material courses, this lab is equipped with high technology equipment to measure the compressive strength of concrete, tensile strength of steel, properties of cement and aggregates. Also installed the software that that serves for student learning and research.
- Soil Mechanics laboratory: a general lab for all BLDG & CISE students; mostly used for teaching geology, soil mechanics and foundation courses, this lab is equipped with high

technology equipment such as (Triaxial apparatus, Direct shear box, Oedometer, Proctor, Geonor, ….). Also installed the software that that serves for student learning and research.

The overall evaluation of the study organization of the BLDG & CISE study programme from students is quite good, reflecting the usefulness and value of BLDG & CISE study programme assistance and service including study programme academic assistant and lab assistance. Some students did give feedback that it was hard sometimes to get access to and use lab equipment. With the wide variety of lab equipment, the laboratories have full time lab engineers and technicians to support the students to perform the experiments correctly. Also, the BLDG & CISE team has introduced students to how to contact and get access to the BLDG & CISE laboratories. This results in an open gateway to our students who would like to use Lab facility for their study and research.

All lecturers at the BLDG & CISE study programme have selected a fixed interval in the week to be ready in the office hour for student consultation regarding the taught topics and other related issues.

In addition, the lecturers always work with faculty assistance and lab engineers to solve issues of students, consult students in categories such as share experience on how to improve the score, make a good schedule, experience with exams, and so on. Besides. It also provides good advice for students who failed many modules on how to make a good learning and completeness of their study.

Most lecturers who are teaching in the BLDG & CISE study programme are working on research projects. BLDG & CISE students can apply and join their lecturer's project to improve their expertise in the field of study. Also, the students are guided on how to write a proposal or technical paper and how to approach a research problem. By this way, a student learns how to take an approach and solve a technical problem, including how to draft a concise technical report

Also, there are two laboratories in Two different rooms, which are equipped with modern technology and software that fulfils all teaching and studying requirements for all the students who graduated from CISE study study programme. CISE postgraduate labs are equipped with modern machines, tools, types of equipment, and technology.

- Solid Waste lab: a general lab for Postgraduate CISE students, this lab is equipped with high technology equipment. This lab has also installed software that meets the requirements of the study programme modules.

- Water Lab: a general lab for Postgraduate CISE students, this lab is equipped with high technology equipment. This lab has also installed software that meets the requirements of the study programme modules.

6.1.8 Learning resources and student support of ERGY

In order to support teaching and research activities, the ERGY study programme is equipped with electrical and mechanical engineering laboratories, learning centers, and digital libraries, as listed below:

6.1.8.1 Laboratories of the Department of Mechanical Power Engineering

6.1.8.1.1 Refrigeration and Air Conditioning Laboratory

Refrigeration and air conditioning lab trains the students on refrigerator and air conditioning components such as compressor's types, condenser types, electric connections, mechanical troubleshooting, electrical troubleshooting, tube welding and cycle charging.

1. Refrigeration educational unit (**Fehler! Verweisquelle konnte nicht gefunden werden.**)
2. Industrial cooling unit with cooling tower
3. Relative humidity meter
4. Avometer device
5. Air flow meter
6. Air temperature and humidity measurement device
7. Vacuum pump
8. Research cooling room (2m X 2m X 2m)
9. Air conditioning unit 7.5 horse
10. Research unit to study the performance of the evaporator
11. Research unit to study heat transmission
12. Air velocity device
13. Charging meter

6.1.8.1.2 Internal Combustion Engines Lab

The lab is equipped with several working models of internal combustion engines including a spark-ignition engine, and compression-ignition engine. Students conduct experiments on each of these engines to study and assess their performance.

1. 75 kW 4 cylinders, water cooled, 4-stroke, Petrol engine mounted on a water brake dyno
2. 12 kW 2 cylinders, air cooled, 4-stroke, Diesel engine genset
3. 2kW engine test kit: (**Fehler! Verweisquelle konnte nicht gefunden werden.**)

3.1. 2kW single cylinder air cooled 4-stroke petrol engine
3.2. 2kW single cylinder air cooled 4-stroke Diesel engine
3.3. 2.5 kW Water brake dyno
3.4. Electronic engine indicating system (PC, cards and software)
3.5. Pressure dynamic transducer
3.6. Rotary pulse encoder with TDC sensor

4. Exhaust gas analyzer
5. Tachometers
6. Educational engine model
7. Thermocouples
8. 3 hp air compressor

6.1.8.1.3 Thermodynamics/ Fuel and Oils Laboratory

The lab offers several experimental setups for measuring the calorific value of fuel, measuring the carbon residue in the fuel, measurement of flash point and fire point of an oil, determination of viscosity of an oil, calibration of pressure gage and thermocouples, determination of ash content, moisture content in fuel etc. Also, students are able to know the procedure of determination various thermodynamic properties.

1. Gasoline vapor pressure gauge
2. Pensky-Martens Closed-Cup Flash Point Tester
3. Oil Viscometer (Viscosity Meter)
4. Distillation device (gasoline)
5. Pressure calibration device (deadweight tester)
6. Thermal insulation measurement device
7. Thermal conductive laboratory meter
8. Gas fuel calorimeter
9. Liquid/solid fuel calorimeter

6.1.8.1.4 Combustion Laboratory

The lab consists of several experimental setups for studying gas turbine combustion, swirl combustion, air pollution, internal combustion engines, highly preheated air combustion, droplet/spray combustion and thermal destruction of solid and liquid wastes and biomass gasification.

1. Exhaust gas analyzer
2. Gaseous Flame speed measurement device
3. Desalination device
4. Flow rate meters

5. Plate heat exchanger
6. Water desalination device
7. fins thermal efficiency measurement device
8. Thermocouples
9. Avometer device
10. Combustors
11. Burners
12. Gasifiers
13. Air compressor
14. Blowers

6.1.8.1.5 Fluids Laboratory

The lab consists of several experimental setups for verifying the basic laws of fluid mechanics and some flow measuring devices. The lab houses experimental setups of a Pelton wheel and a Kaplan turbine which facilitate the study and performance test of turbines. Also, experimental setups for several types of pumps.

The lab contains also a solar water heater simulator, waste heat recovery simulator, and wind anergy simulator.

1. Computer Controlled Thermal Solar Energy Unit (Solar water heater simulator) (Figure 10
2. Computer Controlled Wind Energy Unit (Wind energy simulator) (Figure 11)
3. Computer Controlled Organic Rankine Cycle Unit (geothermal /solar thermal / biomass/ waste heat recovery system) (Figure 12)
4. Air compressor
5. Blowers
6. Flow rate meters
7. Pressure calibration device
8. Pumps test device
9. Pelton Turbine test device
10. Flow bench educational device
11. Device for the transport of solids through pipelines

6.1.8.1.6 Solar Energy Lab

The lab provides facilities for undergraduate teaching in solar thermal energy, final year projects and for research work leading to postgraduate degrees.

1. Solar water heaters
2. Radiation irradiance measurement device

3. Temperature sensors
4. Flow rate sensors

6.1.8.1.7 Logic Control Laboratory

1. 17 PC
2. Pneumatic Training system
3. Compressor

6.1.8.2 Laboratories of the Department of Mechanical Power Engineering

6.1.8.2.1 Power Systems Lab

The power system lab contains experiments related to the power system simulator; The Smart Grid Power System Series, "AEL-MPSS", has been designed by Edibon for the training at both the theoretical and practical levels in the field of Power Generation, Transmission, and Distribution, Consumption, Protections Relays, Renewable Energies and Micro-Grids Power Systems. (Fig. 6)

6.1.8.2.2 Power Electronics Lab

The power electronics lab contains experiments that include variable speed drives and active filters, mostly from Schneider Electric.

Among other single-phase and three-phase inverters and rectifiers from different suppliers. Also, an educational kit from Schneider electric contains the power factor correction solutions with an active filter included. (**Fehler! Verweisquelle konnte nicht gefunden werden.**)

6.1.8.2.3 Protection and control Lab

The protection lab contains commercial equipment from Schneider Electric, like medium voltage circuit breakers with digital protection relays and advanced distribution management systems. **Fehler! Verweisquelle konnte nicht gefunden werden.**)

6.1.8.2.4 Electrical Machines Lab

The electrical machines lab includes experiments on various types of AC and DC machines equipment supplied by suppliers like Lucas Nulle. It hosts two complete sets of universal AC motors and a DFIG kit, TERCO power suppliers and several other kits. TERCO power supply: 380V Variable AC volt - 380 Variable DC volt

Lucas Nulle Machine: 1 KW 380V AC machine (**Fehler! Verweisquelle konnte nicht gefunden werden.**)

6.1.8.2.5 High-Voltage Lab

The high-voltage laboratory is one of the most prestigious labs in the whole faculty; the lab consists of two sections, the first one is used for the testing of the breakdown of gases based on different geometrical shapes and the testing of breakdown in liquids used as an insulator in the transformers.

The second section is used for testing suspension insulators in various weather conditions, the testing of horn gaps, and testing of the sphere gaps. Each lab contains the essential equipment from the protection switchgear required measurement devices and the testing transformers. This lab is used for undergraduate studies as well as postgraduate research.

6.1.9 Egyptian Knowledge Bank (EKB)

The EKB is one of the most sophisticated educational services around the world with an array of tools. EKB bestows unlimited educational and scientific resources exclusively for Egyptians, with more than 35 content providers/publishers from the top ranked worldwide who signed long-term arrangements with the government. The Egyptian Knowledge Bank has collaborated with multiple technology providers to ensure its users a search experience that is wholesome, productive, timesaving, multidisciplinary, and accurate. For University professors and students: It provides access to all academic resources as well as other portals. All students have free access using their IDs only.

6.2 Assessment

Students have access to sufficiently large rooms for teaching as well as well-equipped practice rooms for all degree programs. Numerous laboratories offer specific learning and working opportunities for students. The equipment must meet industrial requirements. As a university, it is not easy to constantly provide the latest equipment in a rapidly developing industry. The problem here is that some equipment is outdated, for example the Siemens Lab 300 is no longer used in control technology, so teaching should no longer take place on such equipment. However, teaching on such equipment always contributes to students' basic understanding, so this point should not be seen as a major problem. Otherwise, the technical equipment corresponds to the current processes in industry. It would make sense to consider involving local and regional industry more closely in practical teaching. On the one hand, this would ensure that current equipment and processes are taught and, on the other, that the needs of industry are always included in teaching.

The university has a well-equipped library that has all the important basic works for the degree courses available, or books that are not available can be ordered. The library offers students access to all important electronic journals and publications, enabling them to keep up to date with the latest developments in their subjects. Especially the Egyptian Knowledge Bank is here mentioned as a data bank, which provides many knowledge resources to students and teaching staff in Egypt.

The university has sufficient financial resources to sustainably finance the study programs and to ensure the implementation of teaching and exercises.

Numerous central facilities take care of student support and the quality of studies at Ain Shams University. The Quality Unit covers the quality control of teaching across all faculties. In addition to its own monitoring, evaluations are also carried out by students at regular intervals. These are likely to be every semester. Maybe it would be possible, to proceed the evaluation also by the faculty of engineering.

Diversity of students is good and in-presence teaching is priority. There is a strong focus on learning content by practical assignments aligned with the classroom lectures. More advanced teaching methods such as blended learning or inverted classrooms are available in a few classes and have some potential for further development in the future. It would also be useful to provide students with advice and support for stays abroad.

6.3 Conclusion

The criterion is **fulfilled.**

7 ESG Standard 1.7: Information management

Institutions should ensure that they collect, analyse and use relevant information for the effective management of their programmes and other activities.

7.1 Documentation

FoE regularly collects evidence-based data and feedback from students, graduates, and other stakeholders of FoE to measure quality, determine areas needing adjustment and to continuously improve study programmes as well as measuring instruments and processes.

These data are:

- Students' enrolment: The number of students enrolled in each study programme is collected yearly, and the data for each study programme is analysed over a five-year period. The data gathered give an indication of the performance of the study programmes.
- Students' recruitment, retention, progression and graduation rate: The institute has set up a system to determine the recruitment rate whether through questionnaires or through the recruitment office. A thorough evaluation of the recruitment rate provides the institute with an indicator of study programme performance.
    - The retention is calculated as the percentage of new entrant students who were active beyond early withdrawal period in YYYY-1 who are still active beyond early withdrawal period in YYYY. Retention figures do not take into account progression between academic levels, they are simply a measure of whether a student is still active or not.
    - Progression is calculated as the percentage of students taking assessment in an academic year who have achieved enough credit to progress to the next level of their study programme. 'Progression' in this instance does not consider special circumstances awarded at exam boards and is therefore only intended as a mathematical representation of student progression based on credits achieved.
    - Graduation rates the number of graduated students with their grades are gathered every year. The percentage of the graduated students to the total number of students in the senior year is calculated and is set in the study programme report.

    All the data required for calculating students' recruitment, retention, progression, and graduation rate are gathered automatically from the information management systems and are available for students' affairs, unit heads and quality units.
- Transferred students' and refugee students' rate: The number of transferred students from and to each study programme is gathered at the start of each academic year, and

the reasons for these transfers are analysed by a committee comprised of the unit head and the study programme's academic advisors. If there is any problem behind the transfer from the study programme, an action plan is created to address the problem, and if there is a good practice behind the transfer to the study programme, that practice is continued. The number of refugee students is also gathered at the start of the academic year. All the data required are gathered automatically from the information management systems and are available for student's affairs, unit heads and quality units.

- Yearly proposed action plan and the progress on previous year's action plan: At the end of each academic year, a committee comprised of unit head, study programme coordinator and academic advisors discuss the progress of previous year's action plan and set the new action plan for the new academic year. The action plan is set in the study programme report. The responsibility and time plan for each action is defined. The study programme report is discussed on the ICHEP board and then sent to the quality unit.
- Course files: The quality unit revised the items required to fulfil the course file of each course at the start of each academic year and announced the course file checklist (annex 35) on the information management systems. Each instructor uploads the necessary files to the IMS, and the quality unit reviews them before deciding whether to accept, reject, or modify them. After a predetermined period, the quality unit reports to the faculty council on the status of the course files and the percentage of submitted and approved files to the total number of courses.
- Industry advisory board reports: The main purpose of the advisory board process is to help and advise the study programmes in identifying the best education practice to achieve competitive advantage and to identify present and future needs of industry. Before the event by a week, the study programme coordinator sent a clear statement to the invited members of what are expected from them and the required documents. During the event photos are taken and reports are written. Throughout the event, photographs are taken, and reports are written. Reports and photos are delivered to study programme coordinators. The recommendation is then evaluated, an action plan is developed, and the final report is delivered to the quality unit.
- Internal and external audit on the study programmes: The internal and external audit of the study programme is conducted every two years with the aim of improving the performance of the study programme. The following tasks are required from each auditor:
    - Revise the Study programme and courses specifications for the academic year underlying review. The final report should include clear feedback regarding any proposals to amend/update the study programme and courses specifications.

- Revise the Study programme and courses reports for the academic year underlying review.
- Review the summative assessments for courses and their model answers/evaluation criteria. The final report should include clear feedback regarding the validity and suitability of these assessments to achieve the course “Intended Learning Outcomes (ILOs)” and its validity to accurately measure the student’s level of achievement.
- Review the students’ portfolio samples for all courses. The final report should include notes regarding the consistency of the assessments’ evaluation and their model answer/evaluation criteria.
- Review the final score statistics for every course separately _included in the course report_ in terms of statistical curve consistency of the result with the standard Gaussian curve. The final report should include notes and correction suggestions in case of non- Gaussian curves.
- Review the (SSR) for the current academic year underlying revision. This revision should be in light of the standard revision report of “National Authority of the Quality of Education and Accreditation (NAQAAE)”.
- The auditor final report should include a clear statement regarding how far this (SSR) fulfils the needs of NAQAAE accreditation criteria.
- Prepare the final external auditor report according to certain report template.

The results are sent to the quality unit. The quality unit conducts the necessary analysis and reports the findings to the unit head, course coordinator, and academic advisors. The unit head acts whenever it is necessary.

- Mid-term and end term questionnaires for courses done by students: The mid-term and end term questionnaires aim to improve the quality of the courses in respect of teaching and learning resources. This evaluation is conducted for each course offered at FoE, in all study programmes. It is done electronically on the IMS. The results appeared to each instructor. Each instructor response to the evaluation and sends the evaluation and the response to the quality unit through IMS.
- Advising Evaluation: The Advising Evaluation provides information on the academic advising system each academic year. Evaluation results help in improving the advising process and point out the deficiencies and problems that face the students in the system. At the end of each academic year the students audit their academic advisors. The results

are announced to the unit head and the quality unit. Action is taken whenever it is necessary.

- Exit survey for newly graduates: The Exit survey gives feedback on the overall satisfaction with the study programme and future career perspectives of the graduates. The results are sent to the quality unit. The quality unit conducts the necessary analysis and reports the findings to the unit head, course coordinator, and academic advisors. The unit head acts whenever it is necessary.
- Employability Survey for alumni: Employability surveys provide information on the career path of graduates. The results are sent to the quality unit which conducts the necessary analysis and reports the findings to the unit head, course coordinator, and academic advisors. The unit head acts whenever it is necessary.
- Opinion of students and stake holder in any updated study programmes' learning outcomes, mission and goals: The Opinion of students and stakeholders in study programmes' learning outcomes, mission and goals are gathered and analysed when the bylaw is renewed every five years or when any modification has been made in any of them as results of students, internal or external feedback. It takes place either through sending an email or through questionnaires. The results are sent to the unit head and the quality unit to take the required action.

All these gathered data are important tools for continuous improvement in study programme quality as well as ASU's overall quality. The results from the surveys are the source of reference for the decision making of the leaders and for knowing what is working well and what needs attention to continuously improve the quality of the study programmes. For example, results from the course's questionnaire could be immediately used to improve the teaching quality. After getting the questionnaire reports, lecturers have time to give feedback to their students and have appropriate changes, if needed. Furthermore, if a course has negative feedback from students, the UHs and EC/Vice deans can discuss with the respective lecturer later how to improve the teaching quality or have further actions on the issues indicated in the questionnaire report. The Exit survey provides information on workload and difficulty of study programmes, and recommendations from newly graduated on their curriculum. This information can be used in the study programme review later. Another example is that the results of the employability surveys can indicate how well FoE prepared their students for employment.

All results related to academic aspects are reviewed by the Quality Unit which discusses the outcomes of the academic evaluations, draws conclusions, and proposes improvement actions for identified issues. In case of necessity, the committee develops a catalogue of appropriate

improvement measures. Action items listed in the catalogue are implemented by the faculties with the support of the Quality Assurance Office, if necessary.

7.2 Assessment

The quality management system consistently evaluates the programs and the performance areas, that are relevant to teaching and student learning. This evaluation involves various stakeholders, including students, academic experts (both internal and external to the university), representatives from professional practice and graduates. This is done regularly with the participation of the university's member groups and with the involvement of external expertise. The amount, type, frequency, and evaluation of data collected regarding student performance and study quality are coherent and appropriate. Measurable success can be seen, among other things, that due to the assessment process the number of students was subsequently reduced to an acceptable level based on data obtained on study ability and laboratory utilization. Furthermore, input from the industry is actively sought and thoughtfully considered, particularly in the selection of equipment for the laboratories.

Convincingly, there is regular feedback (according to student's statements in the accreditation process) on anonymously collected data on study ability from questionnaire reports. When necessary, corrective measures are promptly identified and implemented. Furthermore, from the conversation with those responsible for the modules, it was convincingly clear that, if the students experience excessive workload, this will be returned back to those responsible for the module, who will initiate optimization measures if possible. Additionally, deviations that require action are brought up in committees (UHs and EK/Vice) and are considered in discussions aimed at enhancing program quality. Students, again according to their statements in the accreditation process, sometimes observe the impact of evaluation results on the implementation of feasible suggestions for improvement in the same semester.

Data essential for the quality management system are collected comprehensively across the university, regularly and adequate. The university documents the results of evaluations and assessments of degree programs within its internal quality management system and in sufficient extent. Furthermore, there is an ongoing effort to digitize and optimize automated data collection processes. The university informs internally and appropriate about the accreditation/evaluation decisions made.

In summary, based on the self-report and interviews during the accreditation process, especially with students and university management, it is evident that the data collection, analysis, and extraction of relevant information are adequate and sufficient for the effective management of the programs.

7.3 Conclusion

The criterion is fulfilled.

8 ESG Standard 1.8: Public Information

Institutions should publish information about their activities, including programmes, which is clear, accurate, objective, up-to date and readily accessible.

8.1 Documentation

All study programme information is accessible via a security system on the faculty website that ensures access to information in accordance with the level of security of the information seeker. For example, all website visitors have access to general information like the curriculum vitae of faculty members, as well as an overview of the faculty's departments and study programmes.

However, only students enrolled in courses can access course materials. The ability to display evaluation scores is restricted to each student, whereas the ability to display evaluations of a faculty member's performance is restricted to the assigned member and a small number of the performance evaluation unit's members in the Quality Unit.

The faculty website (https://eng.asu.edu.eg/) is considered as the main platform for accessing important information as:

- Bylaws at https://eng.asu.edu.eg/education/undergraduates/bylaws
- International study programmes at https://eng.asu.edu.eg/education/undergraduates/international-study programmes/study programmes/index
- Admission, student recruitment at https://eng.asu.edu.eg/home/applyto/undergraduate
- Academic Calander, study timetables, mid-term and final exam timetables at https://eng.asu.edu.eg/education/undergraduates/time-table
- Field training at https://eng.asu.edu.eg/education/undergraduates/field-training
- Transfer to ASU Engineering 2022 at https://eng.asu.edu.eg/archive/download/949106
- Student chapter at https://eng.asu.edu.eg/services/student_chapter
- Student life and activities at https://eng.asu.edu.eg/more/student-life
- Student information learning system at https://lms.eng.asu.edu.eg/
- Research at https://eng.asu.edu.eg/research
- Library at https://eng.asu.edu.eg/research/1216942
- Academic staff at https://eng.asu.edu.eg/staff
- Career centre at https://eng.asu.edu.eg/more/career-center

8.2 Assessment

The website is relatively updated. However, the 2023 bylaws are not yet published. But a newsletter is published online, containing the current activities performed by different departments and programs, academic activities (workshops and conferences), agreements with new partners, etc. The newsletter provides a regular update about all the academic, staff and students' activities, agreements with the private sector and international academic institutions, in addition to motivating news about the success stories of current students in international contests and competitions.

Although the bylaw of each program is published on the faculty's website, the ILOs of each course/module are not published on the website. Publishing the ILOs of the programs courses is lacking and could be improved be the ASU.

The information is partially available in Arabic, which is not accessible for all the local prospective students and partners. However, all the information is available in English.

The website and the regular newsletters provide a holistic overview about the faculty and the running offered programs.

The University conducts its activities based on the principles of transparency, openness, involvement and awareness of all stakeholders in educational activities, with a focus on students, teaching staff and employers. One of the most important ways of providing information is through the use of information technology and media.

Overall, ASU uses a variety of communication channels to ensure that the public is informed about ASU's degree programs, services and activities and that all inquiries and requests are handled promptly and professionally

8.3 Conclusion

The criterion is fulfilled.

9 ESG Standard 1.9: On-going monitoring and periodic review of programmes

Institutions should monitor and periodically review their programmes to ensure that they achieve the objectives set for them and respond to the needs of students and society. These reviews should lead to continuous improvement of the programme. Any action planned or taken as a result should be communicated to all those concerned.

9.1 Documentation

Course evaluations are gathered for each study programme course twice per semester, prior to the midterm and final exams at weeks seven and 14, respectively. The results of these evaluations are used to continuously improve the study programmes.

The FoE monitors and periodically reviews its study programmes. To do it in a more systematic way, FoE has introduced a one-year cycle and a five years cycle review process as described in previous section.

Each academic year, i.e. one-year cycle, different students and teaching staff evaluations are gathered and reviewed by internal and external educators. The study programme's performance is evaluated in internal quality audits by the faculty's CIQAU. Every five academic years, i.e. five-year cycle, there is an external auditing by NAQAAE and our partner in England, the University of East London, as part of the double degree approval process by UK's Quality Assurance Agency for Higher Education (QAA).

9.1.1 Examples of changes in the study programmes

The participation of the various parties resulted in updating the study programme's teaching regulations by developing the course content and adding/deleting courses to raise the efficiency of the study programme graduate. Most of these updates were reflected on the current bylaw which has been issued in 2018.

Examples of these changes are:

- Some subjects have become compulsory, such as "Computational Intelligence" in "Communication Systems Engineering" (B.Sc.), based on student recommendation. Also "Construction Planning and Scheduling" in BLDG, based on the suggestions of the industrial board.
- All nanomechatronics materials have been changed.
- Some subjects have been changed in the biomechatronic subspecialty.
- More than one material has been combined to become one material, for example, the material of machining with numerical control, computer-aided design and manufacturing and rapid prototyping to become one material.

- Some courses were updated in terms of assessment methods based on both student questionnaires and industrial board meeting suggestions. For instance, “Building Engineering Drawing” assessments methodology were updated to include more computer-based technology.
- A new bylaw, issued in 2018, was prepared to develop the study programme and was approved by the Supreme Council for universities.
- The most important results of measuring student satisfaction appear in knowing the problems and obstacles that students face. That was studied and taken into account in the development of the study programme and in the preparation phase of the new study programme course list in bylaw 2018.
- The results of the learning outcomes evaluation system are reviewed and analysed statistically through the study programme report. This report is issued at the end of each academic year and includes detailed statistics for each course in addition to the overall statistics for the study programme. The results of the students’ evaluations are used in the study programme development to improve the scientific content of the curricula, as well as the teaching performance of faculty members.

9.2 Assessment

The university and its faculties actively gather adequate and comprehensive data on various aspects, including student enrolment, study quality, study feasibility, and student satisfaction to reach their objectives in respond to the need of students and society. The programs undergo regular evaluations conducted by students and central departments It is commendable that the results are consistently shared with various committees for evaluation, such as the Faculty Council, University Council, and Higher Education Council. Moreover, external stakeholders, such as demographic and economic developments and industrial requirements, are taken into account.

A noteworthy positive aspect is the active participation of students in the university's senate meetings on a monthly basis. Based on this, decisions are made and implemented to further optimize the programs. Moreover, external stakeholders, such as demographic and economic developments and industrial requirements, are considered.

In summary, the monitoring, its frequency and its consideration in the ongoing improvement process are sufficient and appropriate.

ASU policies and procedures promote a culture of reflective practice and provide mechanisms for continuous improvement of processes and quality. Improvement requires systematic collection and use of feedback and data, quality benchmarking, input from internal and external experts, ongoing engagement with ASU students as partners, fostering collaborative approaches, acting on lessons learned, and building on best practices.

The involvement of ASU students and their representatives is central to the concept. Students will be empowered to contribute to local and strategic discussions about the quality of education at the University and wider developments that impact on their experience. The framework supports a variety of formal and informal mechanisms to obtain feedback from students at key points in the student lifecycle, such as student surveys, module evaluations, involving student representation on key decision-making bodies, thus ensuring ASU's very good relationship with its students. ASU regularly conducts surveys, evaluations and statistical analyses. Measures to ensure student success are derived on this basis. These are reviewed on an ongoing basis and the results are used for the further development of the degree programs. Those involved are informed about the results and the measures taken in compliance with data protection regulations. Students thus receive continuous quality feedback in order to drive the development of the educational offer and the wider university community, both for themselves and for future students at the university.

ASU's understanding of quality is therefore based on a high level of student involvement in its committee structure.

ASU is characterized by a high diversity of its staff and students, its academic programs, its professional and business partnerships, and its research and business portfolio in the German-Kazakh educational world. This framework facilitates interdisciplinary approaches and collaboration across professional, academic and institutional boundaries and enables ASU to maximize the potential of students and the university itself. This flexible approach requires clear lines of accountability to maintain consistently high academic standards and allow for regular review and improvement of work.

ASU's strategic plan emphasizes the importance of partnership, community and collaboration to achieve ASU's educational, research and enterprise goals. The framework is developed, managed and reviewed through a series of consultative processes that draw on the expertise and experience of ASU's staff, students and partners and the wider academic and professional communities.

In summary, quality assurance is appropriate and functions very well within the organizational structure: The review panel therefore finds that a mature and functioning quality management system is implemented at ASU. From the self-evaluation report and the interview with the program managers and teaching staff, it is clear that a wide range of feedback procedures and evaluation instruments are continuously used in the degree programs.

Overall, in the opinion of the review panel, the quality assurance and development of the degree programs is based on a systematic and comprehensible procedure, enriched by participatory and dialogical opportunities for students to help shape further development in a sustainable manner.

The mechanisms for reviewing quality assurance, such as regular workload surveys and the associated adaptation to the study programs, are implemented sensibly and the resulting outcomes are taken into account.

9.3 Conclusion

The criterion is **fulfilled.**

10 ESG Standard 1.10: Cyclical external quality assurance

Institutions should undergo external quality assurance in line with the ESG on a cyclical basis.

10.1 Documentation

At FoE, cyclical external quality assurance is accomplished in two ways: annually by the external evaluators and every five years by renewing the national accreditation by the National Authority for Quality Assurance and Accreditation of Education (NAQAAE).

10.1.1 National accreditation of the study programmes

NAQAAE was established by the issuing of Law No. 82 for the year 2006. Its executive regulations organized by its corresponding bylaws were issued in 2007. NAQAAE is an independent public authority. It reports to the Egyptian President, Prime Minister, and Parliament. A key part of NAQAAE role is to review how providers of higher education, such as universities and colleges, maintain the quality of their academic standards. NAQAAE also produces a range of other guidance to help education providers ensure that students receive a high-quality experience of higher education. All international ICHEP study programmes have been recently accredited in 2022 from NAAQAE for five years till 2027.

10.2 Assessment

This assessment relies on self-reports and statements from participants, particularly the university management, during online accreditation meetings. The university conducts regular accreditations of its institutions at various levels, including university management and faculty levels. These evaluations are carried out annually by external experts and are also renewed every five years by an independent public authority, NAQAAE (National Authority for Quality Assurance and Accreditation in Education). Furthermore, some programs, including those in the Faculty of Engineering, one in Pharmacy, and one from another faculty, have obtained international accreditation. There are also self-study reports, annual reports, yearly assessments and yearly benchmarks.

To support the faculties with national accreditation, sufficient assistance is provided through satellite focal points. Additionally, there is a university policy for internationalization Accreditation results are accessible internally on internal platforms and on the website of the quality assurance center. It is recommended that the accreditation result also be made publicly available in order to transparently inform the society about accreditation activities and accreditation decisions.

In summary, there is a comprehensive and ongoing system of quality assurance and improvement facilitated by external institutions. The university's commitment to regular accreditation, both at the national and international levels, demonstrates a dedication to maintaining and enhancing educational quality. Making accreditation results publicly accessible would further contribute to transparency.

10.3 Conclusion

The criterion is **fulfilled.**

IV Recommendation to the Accreditation Commission of ACQUIN

1 Assessment of compliance the Standards and Guidelines in the Higher European Area (ESG) in the actual official version and the German Council of Science and Humanities (WR)

The study programmes "**Mechatronics Engineering and Automation Programme" (B.Sc.), "Energy and Renewable Energy Engineering Programme" (B.Sc.), "Building Engineering Programme" (B.Sc.)** and "Civil Infrastructure Engineering Programme" (B.Sc.) were assessed on the basis of the "Standards and Guidelines for Quality Assurance in the European Higher Education Area" (ESG).

The expert group concludes that the **ESG standards** 1.1 (Policy for quality assurance), 1.2 (Design and approval of study programmes), 1.3 (Student-centred learning, teaching and assessment), 1.4 (Student admission, progression, recognition and certification), 1.5 (Teaching staff), 1.6 (Learning resources and student support), 1.7 (Information management), 1.8 (Public information), 1.9 (On-going monitoring and periodic review of study programmes) and 1.10 (Cyclical external quality assurance) are fulfilled.

Comprehensive evaluation of the expert group

Standard 1.1 Policy for quality assurance: Universities have a publicly accessible quality assurance strategy, which is part of their strategic management. This strategy is developed and implemented by internal stakeholder representatives through appropriate structures and processes, involving external stakeholders.

The criterion is **fulfilled.**

Standard 1.2 Design and approval of study programmes: Universities have procedures for the design and approval of their courses. The courses are designed in such a way that their objectives, including the desired learning outcomes, can be achieved. The qualification obtained during a degree study programme is clearly defined and communicated; it refers to the corresponding level of the national qualifications framework for higher education and, consequently, the qualifications framework for the European Higher Education Area.

The criterion is **fulfilled.**

Standard 1.3 Student-centred learning, teaching and assessment: Universities ensure that the courses offered are carried out in such a way as to encourage students to play an active role in the design of the learning process and that this approach is also taken into account when assessing students / examinations.

The criterion is **fulfilled.**

Standard 1.4 Student admission, progression, recognition and certification: Universities ensure that the courses offered are carried out in such a way as to encourage students to play an active role in the design of the learning process and that this approach is also taken into account when assessing students / examinations.

The criterion is **fulfilled.**

Standard 1.5 Teaching staff: Universities ensure the competence of their teachers. They use fair and transparent procedures for the recruitment and further training of their employees.

The criterion is **fulfilled.**

Standard 1.6 Learning resources and student support: The university has adequate funding to finance study and teaching and ensure that there is always a sufficient and readily available range of learning and support available for their studies.

The criterion is **fulfilled.**

Standard 1.7 Information management: Universities ensure that they collect, analyse and use the relevant data relevant to the successful conduct of studies and other activities.

The criterion is **fulfilled.**

Standard 1.8 Public information: Universities publish easily understandable, correct, objective, up-to-date and well-accessible information about their activities and courses of study.

The criterion is **fulfilled.**

Standard 1.9 On-going monitoring and periodic review of study programmes: Universities are constantly monitoring their courses and regularly reviewing them to ensure that they

achieve the goals set and meet the needs of students and society. The tests lead to a continuous improvement of the courses. All affected parties will be informed about any measures planned or resulting from this.

The criterion is **fulfilled.**

Standard 1.10 Cyclical external quality assurance: Universities regularly undergo external quality assurance procedures in accordance with the ESG.

The criterion is **fulfilled.**

2 Accreditation Recommendation

The peer-review experts recommend unconditional accreditation for the study programmes:

“Mechatronics Engineering and Automation Programme” (B.Sc.),
“Energy and Renewable Energy Engineering Programme” (B.Sc.),
“Building Engineering Programme” (B.Sc.)
“Civil Infrastructure Engineering Programme” (B.Sc.)

The peer-review experts recommend the following **study specific recommendations:**

„Energy and Renewable Energy Engineering Programme” (B.Sc.)

1. The number of courses in mechanical engineering should be reduced in favor of courses in electric engineering.

2. The topic of “System controlling” should be implemented in the curriculum.

“Building Engineering Programme” (B.Sc.)

1. Architecture knowledge should be enhanced.

“Civil Infrastructure Engineering Programme” (B.Sc.)

1. An introduction in urban planning and architecture should implemented in the curriculum.

V Decisions of the Accreditation Commission of ACQUIN

Based on the evaluation report of the expert group and the statement of the Higher Education Institution, the Accreditation Commission of ACQUIN decided on its meeting on the 24 May 2024:

Mechatronics Engineering and Automation Programme (B.Sc.):

The study programme "Mechatronics Engineering and Automation Programme" (B.Sc.) is accredited without any conditions.

The accreditation is valid until 30 September 2030.

Energy and Renewable Energy Engineering Programme (B.Sc.):

The study programme "Energy and Renewable Energy Engineering Programme" (B.Sc.) is accredited without any conditions.

The accreditation is valid until 30 September 2030.

The following recommendations are given for the further development of the study programme:

- The number of courses in mechanical engineering should be reduced in favor of courses in electric engineering.
- The topic of "System controlling" should be implemented in the curriculum.

Building Engineering Programme (B.Sc.):

The study programme "Building Engineering Programme" (B.Sc.) is accredited without any conditions.

The accreditation is valid until 30 September 2030.

The following recommendations are given for the further development of the study programme:

- Architecture knowledge should be enhanced.

Civil Infrastructure Engineering Programme (B.Sc.):

The study programme "Civil Infrastructure Engineering Programme" (B.Sc.) is accredited without any conditions.

The accreditation is valid until 30 September 2030.

The following recommendations are given for the further development of the study programme:

- An introduction in urban planning and architecture should implemented in the curriculum.

Glossary

CH	Credit Hour
CHE	Council for Higher Education
CIQAU	Continuous Improvement & Quality Assurance Unit
ECTS	European Credit Transfer and Accumulation System
EFQ	Framework for Qualifications of the European Higher Education Area
FoE	Faculty of Engineering
ICHEP	International Credit Hours Engineering Programmes
ILO	Intended learning outcomes
NAQAAE	National Authority for Quality Assurance and accreditation of Education
NARS	National Academic Reference Standards
QAA	Quality Assurance Agency for Higher Education (of the United Kingdom of Great Britain and Northern Ireland)
SSR	Self-Study Report
SWL	Student Workload
UK	United Kingdom of Great Britain and Northern Ireland