1.0 The Faculty of Energy & Environmental Engineering

1.1 Undergraduate Programmes

The Energy and Environmental Engineering undergraduate programmes consist of a Preparatory Year followed by four years in one of four programmes each of which leads to a Bachelor of Science Degree validated by our UK partner. The four programmes are:

- BSc (Hons) Renewable Mechanical Energy
- BSc (Hons) Renewable Electrical Energy
- BSc (Hons) Biochemical/Engineering
- BSc (Hons) Petroleum Engineering and Gas Technology

Upon successful completion of the Preparatory Year, students are admitted to a programme of their choice if they satisfy the programme’s requirements. These include a maximum number of students per programme in addition to other requirements which are specified by the Department.

The Preparatory Year curriculum provides a foundation for students entering Energy and Environmental Engineering Degree Programmes. It aims to develop students’ knowledge so that by the end of the Programme students can choose their degree specialisation. The Preparatory Year Programme spans two semesters and covers the following modules: Engineering Mechanics, Engineering Drawing, Chemistry, Engineering Production, Mathematics and Physics. Additionally, a module in Engineering Ethics & Human Rights is offered as well as modules in English. The latter is designed to develop students’ English Language and study skills and enable them to make a successful transition from school to university studies.

1.2 Why study in the Faculty of Energy and Environmental Engineering?

The Faculty of Energy and Environmental Engineering at the British University in Egypt is an effective and modern Faculty and offers the most diverse range of Engineering Energy specialisms in Egypt. The overall mission of the Faculty is to provide a broad spectrum of education, research and awarding of locally and internationally accredited degrees in the fields of Energy and Environmental Engineering that enable graduates to develop their knowledge, skills and entrepreneurship, and to contribute to the development of the community.

The Faculty undertakes high quality academic and applied research of relevance to energy, industry and the economy of Egypt and the Middle East. The curricula offered in the Faculty of Energy and Environmental Engineering programmes emphasise both theoretical and practical aspects including design and implementation. It provides students with the theoretical and practical skills that industry and employers require. The Faculty of Energy and Environmental Engineering maintains close partnerships with the energy and industry sectors in Egypt and beyond which substantially benefit the students.

Students in the Faculty of Energy and Environmental Engineering study in an environment that encourages diversity and innovation. Staff are not just academic experts in their fields but often have ‘real life’ practical experience, which they bring to their subjects, as well as close contacts with the ‘world of work’. In this way students in the Faculty of Energy and Environmental Engineering learn not just what to think but how to think.
1.3 BSc (Hons) Renewable Mechanical Energy

1.3.1 Why study BSc (Hons) Renewable Mechanical Energy at the BUE?

The Renewable Mechanical Energy programme focuses on cutting-edge technologies and techniques of green energy that include energy generation, transportation, usage and storage. Such technologies include solar, wind, hydraulic, geothermal and bio energy, as well as, fuel cells and thermal storage. Further concentration is achieved in the last year through four optional modules and two graduation research and design projects.

The Department of Renewable Energy Engineering offers students a distinct programme because:

- It provides state-of-the-art equipment and resources necessary to the study of Renewable Mechanical Energy.
- It exposes students to international experience through participation with international schools of energy and engineering in competitions and summer workshops.
- It exposes students to a diversity of professional expertise in energy.
- It is based on self-learning and research-based academic teaching.
- It is closely linked to the energy market needs.
- It establishes close connection between students and professional practice.

1.3.2 What will I study?

**Preparatory Year**

Upon successful completion of the Preparatory Year and satisfying the entry requirements of the Renewable Electrical Energy programme, students admitted to the Renewable Energy Engineering Department will be enrolled for four years.

**Degree Year 1**


**Degree Year 2**

Students will study modules over two semesters. Some of these modules are designed to consolidate students’ understanding of mechanical concepts, principles, and skills while others cover simple industrial applications. These modules are: Thermodynamics, Engineering Probability & Statistics, Fluid Mechanics, Quality Control and Technical Report Writing. In addition, students study Machine Design, Dynamics of Machinery, Material Properties & Characterisation, Electrical Machines & Control, Production Technology (3), and Numerical Methods.

**Degree Year 3**

Students study an optional module plus a set of nine compulsory modules distributed over two semesters. Most modules concentrate on design of systems and/or components for real life engineering applications. Throughout this year students will enhance their knowledge on how to apply Mechanical Engineering fundamentals into different industrial systems.

**Degree Year 4**

During the fourth year, the students are given the chance to choose 4 elective modules of interest from a wide range of practical modules, as well as, two graduation projects: a group capstone design project, and an individual research thesis. Students may choose to take modules in different fields or select one of the following focus areas: Mechatronics, Materials, Design & Production, Power & Energy, and Automotive & Aeronautics. Students will be guided to choose four optional modules and two graduation projects in these areas.

1.3.3 How will I learn and be assessed?

Teaching involves a mix of lectures, tutorials, laboratory sessions, group work, private study and practical activities. Assessment involves submitting coursework and projects (reports and presentations), and sitting exams.

1.3.4 What career and further education opportunities are open to me when I graduate?

After graduation, students have job opportunities including the design, manufacture, operation and maintenance of energy systems and equipment in all industries, as there is a continuous need of mechanical engineers. Furthermore, many national and international governmental and non-governmental organisations (NGOs) are looking for experts in the field of renewable energy, sustainability and environment.

The multidisciplinary nature of The Renewable Mechanical Energy programme encourages graduates to launch startup companies that will be hosted in the business incubator in the faculty premises.

Students who are interested in pursuing their studies may register for MSc programmes at the BUE (Renewable Energy) or a national / international universities. Also, students can continue their postgraduate studies abroad.
1.4.1 Why study BSc (Hons) Renewable Electrical Energy at the BUE?

The Department of Renewable Electrical Energy offers students a distinct programme because:

- It provides state-of-the-art equipment and resources necessary to the study of Renewable Electrical Energy.
- It exposes students to international experience through participation with international schools of energy and engineering in competitions and summer workshops.
- It exposes students to a diversity of professional expertise in energy.
- It is based on self-learning and research-based academic teaching.
- It is closely linked to the energy market needs.
- It establishes close connection between students and professional practice.
- It offers field trips to very reputable companies in the field of Electrical Engineering.

1.4.2 What will I study?

Preparatory Year

Upon successful completion of the Preparatory Year and satisfying the entry requirements of the Renewable Electrical Energy programme, students admitted to the Renewable Energy Engineering Department will be enrolled for four years.

Degree Year 1

In this year, students study the basic concepts representing the core threads of the programme; mainly physics, calculus, differential equations, measurements, material sciences, physical chemistry, introduction to renewable energy systems and electrical circuits and electrical machines. In addition, students acquire essential skills in technical report writing and data presentation, skills which will help them in later study years.

Degree Year 2

Students develop their knowledge, understanding and skills in probability and statistics, numerical methods, fluid mechanics, energy and environmental issues, basics of electronic circuits and storage technologies. In addition, students begin to learn the essential key issues of management and economics its implementation in their study area.

Degree Year 3

Students develop their skills in electrical energy systems and are introduced to several energy systems in terms of energy transmission, data acquisition and system analysis and maintenance. They learn key information about energy network Design and control of energy plants. They are introduced to the key issues of power generation and conservation systems. More skills are acquired through industrial training.

Degree Year 4

Students continue to develop their skills in electrical energy systems. They develop knowledge and skills in environmental risk analysis. They apply their knowledge, understanding and skills in two main pieces of work: a research project and a design project. In addition, they have a choice of three optional modules to strengthen their fields of interest. To enhance students skills , the programme offers special courses in high voltage engineering, power electronics, power system protection integration, transmission of energies and advanced electrical machine study.
1.5 Why study Biochemical Engineering at the BUE?

Biochemical engineers apply the principles of biology, chemistry, and engineering to produce useful energy related products such as biofuels, biopolymers and industrial enzymes. Biochemical engineering includes biofuels and biological waste treatment. A biochemical engineer is, someone who is responsible for the development of new chemical products that can be used by a multitude of companies and individuals. Their job includes researching, developing, documenting, and producing products that are derived from a combination of organic and lab-made materials that can benefit people and society at large.

Graduates from the Biochemical Engineering Programme are ideally prepared to enter emerging industries in the biotechnology, biofuels and energy industrial fields. Graduates are also well prepared to make contributions to renewable energy, food processing and environmental remediation. The Department has fully equipped laboratories, petrochemicals, and facilities to support learning and the development of knowledge and professional skills.

1.5.1 Why study Biochemical Engineering at the BUE?

1.5.2 What will I study?

Preparatory Year

Upon successful completion of the Preparatory Year, and satisfying the entry requirements of the Biochemical Engineering programme, students admitted to this department will be enrolled for four years.

Degree Year 1

Students study basic modules including advanced mathematics, physics, organic and analytical chemistry and energy sources to gain a foundation for future problem analysis. In addition, they cover modules related to the basics of biochemical engineering, fundamentals of microbiology, fundamentals of biochemistry and biomass for biochemical engineering, material engineering and structure and stress analysis; these modules help widen the knowledge of students to support their future development as Biochemical Engineers. The modules provide the capabilities to acquire the underpinning knowledge and analytical skills for process design and engineering.

Degree Year 2

The modules studied provide the focus to enable students to become a Biochemical Engineer. Modules include concepts of mass and energy balances, biophysics, unit operation which are the core of biochemical engineering applications, as well as fluid mechanics, thermodynamics, fundamentals of heat and mass transfer and modeling and simulation.

Degree Year 3

Students focus on the bioreactor design, process plant design, bioremediation of environmental pollution, green fuel, biofuel, bio product, nanotechnology for biochemical engineering experimentations and methods of calculations and analysis of chemical industries. They learn how to design a bioreactor plant in terms of overall performance and petroleum bioprocessing. Additional modules focus on legislation and regulations, foundation of marketing and economics of bioenergy.

Degree Year 4

Students continue to develop their skills in biochemical energy systems. They develop knowledge and skills in environmental risk analysis. They apply their knowledge, understanding and skills in two main pieces of work: a research project and a design project. In addition, they have a choice of four optional modules to strengthen their fields of interest in process design and simulation, engineering economics, evaluating sustainability, process plant operation, advanced control systems, occupational, health, safety engineering and environmental management systems. Also, students have the opportunity to complete a research project and design project to apply their knowledge and acquired skills to achieve a certain objective for local problems.
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1.6 BSc (Hons) Petroleum Engineering and Gas Technology

1.6.1 Why study BSc (Hons) Petroleum Engineering and Gas technology at the BUE?

The Petroleum Engineering and Gas Technology Department provides an honours degree in the field of Petroleum Engineering and Natural Gas Technology. Students graduating from the British University in Egypt are highly skilled in the E&P industry locally and internationally. BUE’s graduates typically work in various disciplines in industry including: drilling engineering, reservoir engineering, production engineering, production technology, and formation evaluation engineering. The Petroleum Engineering and Gas Technology Department is fully equipped with a range of well-equipped laboratories.

1.6.2 What will I study?

Preparatory Year

Upon successful completion of the Preparatory Year, and satisfying entry requirements of the Petroleum Engineering and Gas Technology programme, students admitted to this department will be enrolled for four years.

Degree Year 1

In this year Students will develop knowledge, understanding and problem solving skills in basic science modules (Mathematics, Physics and Chemistry) that are essential for their study in the PEGT Programme. In addition they will study the Basic Engineering Sciences (Materials Science, Thermodynamics, Fluid Mechanics and Structural and Stress Analysis) which are a pre-requisite for understanding Petroleum Engineering modules. Furthermore, they will study the basic concepts of Petroleum Engineering and Geological Principles of Petroleum Exploration. Students also acquire essential required skills in computer programming and technical report writing.

Degree Year 2

Students continue to consolidate their knowledge, understanding and problem solving skills in Basic Sciences and Basic Engineering Sciences including Engineering Probability and Statistics, Numerical Methods, Organic and Analytical Chemistry, Fundamentals of Heat and Mass Transfer, and Machine Design. Students also acquire an understanding of surveying instrumentation and observation techniques and limitations. In addition students study the basic concepts representing the core of the Programme, namely Drilling Engineering and Drilling Fluids, Reservoir Rock and Fluid Properties and laboratory work.

Degree Year 3

Students focus on the most important aspects of Well Logging, Petroleum and Natural Gas Exploration, Reservoir Engineering, Reservoir Modelling and Simulation, Well Testing, Petroleum-Production Engineering, and Equipment. Gas and Oil Industry. In addition, students are introduced to key concepts of Petroleum Economics and Legislation. Students begin to learn the essential key issues of Engineering Project Management and its implementation in their study area. Furthermore, through field courses practical modules, students acquire essential skills required for the production of topographical, geological and structural maps.

Degree Year 4

Students focus on Advanced Reservoir Engineering, Reservoir Management, Surface Production Facilities, Enhanced Hydrocarbon Recovery, and Gas Condensate Reservoir Engineering. Students are required to accumulate all their gained knowledge through a graduation project in one of the main areas of Petroleum Engineering, Exploration, Drilling, Production, Storage and Transportation, Operation and Processing, or Enhanced Hydrocarbon Recovery. The project comprises a research component in addition to a design component with the main aim to provide students the opportunity to implement the acquired skills in research, analysis, and design. In addition, two optional modules are required in order to establish the necessary theoretical background required for the project.

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1.6.3 How will I learn and be assessed?

Teaching involves a mix of lectures, tutorials, group work, self-study, practical and field activities. A variety of assessment methods involves submission of coursework, problem sets, in-class group assessments, siting exams, presentations and projects. The Programme emphasises hands-on practical and field work to enhance the student’s appreciation and understanding of technical and theoretical concepts. Students are also encouraged to engage in two industrial internships in the summer of Years Two and Three which expose them to environments of real petroleum projects. The Programme also enhances research and communication skills of its graduates through a variety of research assignments.

1.6.4 What career and further education opportunities are open to me when I graduate?

Petroleum Engineering provides career opportunities in the following fields in national and international companies:

- Petroleum exploration and drilling of oil, gas and water wells in service, joint ventures, and operating companies
- Petroleum (oil and gas) production operations
- Petroleum Reservoir Engineering
- Petroleum research exploration and production disciplines in private, government agencies, universities and national or international companies
- Well services activities in oil services companies
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1.7 How to apply for a programme in the The Faculty of Energy & Environmental Engineering

a. Read the admissions section in our general booklet. This can also be downloaded at www.bue.edu.eg
b. Submit an application online at www.bue.edu.eg
c. Call the BUE Hotline and speak to a member of staff in the Student Affairs Department in you require further information - 19(BUE) 19283

1.8 When to apply:

a. The early admissions period begins in January of each academic year.
b. Applicants are encouraged to apply early to secure a place in their chosen programme of study.
c. Once programmes are full the applicants will be placed on a waiting list.
Learn How To Think Not What To Think