Faculty of Engineering
Undergraduate Prospectus
2025/2026

The BRITISH UNIVERSITY IN EGYPT

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London South Bank University

1.0 THE FACULTY OF ENGINEERING

1.1 Undergraduate Programmes

The Engineering undergraduate programmes consist of a foundation Year followed by three years in one of nine programmes, each leads to a Bachelor of Science Degree.

- Architectural Engineering.
- Landscape & Urban Development for Sustainable Cities
- Chemical Engineering (Petrochemical, Environmental and Pharmaceutical degrees).
- Civil Engineering.
- Construction Engineering and Management.
- Electrical & Communications Engineering.
- Computer Engineering.
- Mechanical Engineering.
- Mechatronics and Robotics Engineering (Mechatronics, Robotics degrees).

Students are admitted in a programme of their choice from day one provided that they satisfy any additional programme requirements. These include a maximum number of students per programme in addition to any other requirements which are specified by the relevant department.

The Foundation year provides the needed background knowledge, relevant to the selected programme of study.

The Foundation year is the first year in the programme of study and is tailored towards the specific programme requirements & needed skills.

The Foundation year also offers two English language modules, one for academic purposes and the second for academic writing.

1.0 THE FACULTY OF ENGINEERING

1.2 Why study in the Faculty of Engineering?

The Faculty of Engineering at the British University in Egypt is an effective and modern Faculty and offers the most diverse range of specialisms in Egypt. The Faculty of Engineering strives to be globally recognized as a leading student-centered institution dedicated to develop life-long learning graduates and engineering pioneers with both local and global prospective to benefit the Society.

The Faculty undertakes high quality academic and applied research of relevance to industry and the economy of Egypt and the Middle East. The curricula offered in the Engineering programme emphasize 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 Engineering maintains close partnerships with industry in Egypt and beyond which substantially benefit the students.

Engineering students 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 all aspects of the engineering profession. In this way students in the Faculty of Engineering learn not just what to think but how to think.

The Faculty of Engineering at BUE prepares its students to be competitive on the Industrial front, by giving them the opportunity to gain practical experiences, at an early stage, through the Summer Internship programme (Section 1.2.1) in addition to investigating and proposing innovative solutions for real life industrial problems and challenges through their final year graduation projects (section 1.2.2)

1.2.1 Summer Internships Programme

Engineering students at BUE are required to perform "Summer Training Internships" during the summer of the second & third year of their programme. BUE is committed to secure opportunities for its students, however, individual students can secure opportunities for themselves provided that the company nature is appropriate to the student's specialization and after the approval of relevant department.

Summer Training Internships shall be conducted over two phases according to the level of knowledge and skills gained by the students, in the summer of degree YR 2, students are required to be trained in Engineering sites and/or factories while in the summer of degree YR 3, they are required to be trained in design offices and/or withing research groups.

At the end of the training period, students are required to submit a report, conduct a presentation in front of a panel at BUE and present a training completion certificate to their relevant engineering department.

It is worth mentioning that "Summer Training Internships" are considered as Pass/fail modules and are compulsory graduation requirements.

1.2.2 Final Year Graduation Projects

Graduation Projects are considered an important component of any engineering programme. The Faculty of Engineering at BUE requires its students to submit two graduation projects, the first is a research project while the second is a design project. Research projects are the product of creative and innovative ideas of the engineers of tomorrow. Research graduation projects at the Faculty of Engineering are aligned with the industry requirements and the national strategic interests which inform the topics offered for students to work on.

Design graduation projects aim to present the students with the experience of the integral design process from preparation of the brief through to detailed design drawings, if applicable. It is expected that students are able to draw on results of their individual research projects that relate to parts of the design project and integrate all individual components into a comprehensive viable design.

1.0 THE FACULTY OF ENGINEERING

1.3 Architectural Engineering

1.3.1

The Department of Architectural Engineering offers students a distinct programme because:

- It provides state-of-the-art resources necessary to the study of architecture.
- It exposes students to international experience through participating in international schools of architecture's competitions and summer workshops.
- It exposes students to a diversity of professional expertise.
- It is based on self-learning and research-based academic teaching.
- It is closely linked to the market needs.
- It establishes close connection between students and professional practice.

1.3.2 What will I study?

Degree Year 1

In this year, students study modules related to the basic sciences including Mathematics, Mechanics, Chemistry and Physics in addition to human sciences related modules representing English, technical writing and ethics. Moreover, students will study the concepts representing the core threads of the programme; mainly Architectural Design, Building Technology, History of Architecture and Art. In addition, students acquire essential skills in manual drawings and CAD drafting, coloring, writing reports and data presentation skills, which will help students in later study years.

Degree Year 2

Students develop their knowledge, understanding and skills in Environmental Architectural Design, Design Principles and Visual Design as well as Building Construction and services. They are introduced to city planning and housing in addition to construction materials, project management and construction contracts as well as theory of architecture. By the end of this year, students should have acquired the necessary knowledge and understanding of basic architecture engineering topics using computer applications in architecture for modeling and presentation. Students will have the opportunity to study semester (1) in London South Bank University.

Degree Year 3

Students develop their skills in Architectural Design and are introduced to Working Drawings, Theory of Architecture, Geotechnical Engineering and Surveying, Building Economics and Quantity Surveying in addition urban design and landscape. Students will have the opportunity to select three optional modules from a variety of categories including computer applications in architecture, project management, urban regeneration and human behavior as advanced building service. More skills in 3D Computer Graphics are acquired. By the end of this year, students have developed their skills ready to undertake their graduation project in the final year.

Degree Year 4

Students continue to develop their skills in Architecture Design and are introduced to interior design and environmental impact assessment. They apply their knowledge, understanding and skills in two main pieces of work: a Graduation research project and a Graduation design project. In addition, they have a choice of four optional modules to strengthen their fields of interest in: Lean Construction, advanced computer applications, advanced Landscape Architecture, architecture of arid environment, advanced theories of architecture and finally E-construction and virtual reality. By the end of this year, students are ready to join professional practice in the Architectural Engineering field.

1.0 THE FACULTY OF ENGINEERING

1.3 Architectural Engineering

1.3.3 How will I learn and be assessed?

In the Architectural Engineering Department, students will engage in a comprehensive learning experience that integrates theoretical knowledge with practical application. The curriculum emphasizes critical thinking, creativity, and technical skills through a combination of lectures, studio work, and hands-on projects. Assessment methods are diverse, including written examinations, coursework, and project-based evaluations. A significant portion of the assessment is through design studio projects, where students present their work to faculty and peers, simulating real-world architectural practice. Additionally, students are encouraged to engage in independent research and collaborative group work, fostering a holistic understanding of architectural engineering principles. Continuous feedback from tutors ensures that students develop their skills progressively, preparing them for professional roles in the industry.

1.3.4

Graduates of the Architectural Engineering program can pursue a variety of professional fields. They can become architectural engineers, specializing in the integration of building systems and structural design. Construction project managers are another path, where they oversee construction projects from inception to completion, ensuring they meet design specifications and standards. They might also work as building services engineers, focusing on the design, installation, and maintenance of essential systems like heating, ventilation, and air conditioning (HVAC). Additionally, graduates can work as sustainability consultants, advising on environmentally friendly practices and sustainable design. Some may choose to become urban planners, helping to shape the development of communities and cities . For those who are interested in the aesthetic and functional aspects of interior spaces, a career as an interior designer offers the opportunity to create visually appealing and functional interior environments. Each of these fields offers unique opportunities to apply their skills and contribute to the built environment.

1.0 THE FACULTY OF ENGINEERING

1.4 Chemical Engineering

1.4.1

Chemical Engineering (ChE) at BUE is a world class discipline that will bring you a cutting-edge career to compete with international counterparts. ChE occupies a unique position at the interface between science and engineering. It deals with conception and process design for production and transformation of materials and energy into useful and valuable products to modern societies and human welfare. You find its applications and input all around including in food industry, cosmetics, vehicle fuels, polymers and plastics, water, detergents, medicine, paper, chemicals, agricultural fertilisers and energy.

Students can study Chemical Engineering and choose from three different specialisms: Petrochemical Engineering, Environmental Engineering and Pharmaceutical Engineering. Our academic staff have international expertise and proven research experience that allows students to be in an up-to-date professional environment.

The Department has fully equipped laboratories, petrochemicals, and facilities to support learning and development of knowledge and professional skills.

1.4.2 What will Istudy?

Degree Year 1

Students study basic modules including Mathematics, Physics and Chemistry to gain a foundation for future problem analysis. In addition, they cover modules related to Materials Engineering, Technical Writing, Drawing and Production Technologies; these modules help widen the knowledge of students to support their future development as Chemical 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 Chemical Engineer. Modules include concepts of Mass and Energy Balance which are the core of Chemical Engineering applications, as well as Polymer Basics and Fluid and Momentum Transfer to deal with transportation of liquids and gasses. At the end of this year, students will be able to analyse basic Chemical Engineering problems and applications and complete calculations for materials and energy. In addition they will be prepared for modules on Process Design and Economics.

Degree Year 3

Students focus on the fundamentals of process design, experimentations and methods of calculations and analysis of chemical industries. Students study methods of the design of mass transfer operation and equipment, heat transfer equipment and general unit operations. They learn how to design a complete chemical plant in terms of overall performance and a whole system. Additional modules focus on, chemical reactor design, design of equipment, the chemical function of the process, vessel design for material and mechanical design, applications of organic technologies, safety, and process simulation.

Degree Year 4

The final year aims to provide students with a solid background, knowledge and practical skills in one of three specials, Petrochemicals, Environmental Engineering or Pharmaceutical Engineering. Students select a specialism according to the students' future career plans:

(i) Environmental Engineering.

(ii) Petrochemical Engineering.

(iii) Pharmaceutical Engineering.

A specialism will be offered in Year 4 only if the number of students reaches critical mass.
In each specialism students focus on modules which provide them with the required in-depth knowledge and skills. Also, students will complete research and design projects to apply their knowledge and acquired skills to achieve a certain objective for a given local problem. At the end of this year students are expected to be well-qualified chemical engineers with a strong background in one area of specialism.

1..0 THE FACULTY OFENGINEERING

1.4 ChemicalEngineering

1.4.3 How will I learn and be assessed?

Teaching is given in combinations of lectures, tutorials, lab experiments, group and individual work. Students are often given time for private studies to allow greater analysis and application of learning.

Presentations are also required to give students the confidence in expressing themselves in a professional manner and to ensure the successful delivery of ideas.

Assessments are performed according to module specifications; assessments will include submitted course work, exams, presentations, lab reports and design and research projects.

In the second and third years, students are expected to do a summer training programme to ensure hands on knowledge and to gain greater professional skills and an understanding of engineering ethics. Training can be locally in Egypt or it can be done in an international setting.

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

The job market for Chemical Engineers is very rich. Chemical Engineers can pursue a career in one of the following areas: Industry, Academia, Consulting, Process Design, Operation and Production, Research and Development, Management, Control, or as an Environmental Advisor.

Top Industries in the job market are varied, including chemical industries, water treatment plants, power stations, pharmaceutical companies, petroleum refining and gas technologies, cement industries, polymer and plastics industries, painting industries, petrochemical industries, fertilizer industry, paper industries, renewable energy industries, food industries.

1.0 THE FACULTY OF ENGINEERING

1.5 Civil Engineering

1.5.1 Why study Civil Engineering at the BUE?

The Civil Engineering Department, at BUE, graduates general Civil Engineers with a specialisation in one of six major specialisms. Specialisation is created through three parallel paths.

The first comprises two industrial placements in the summer of Years Two and Three. The second is 40 credits worth of project effort divided into 20 credits of an individual research project and 20 credits of a group design project. Finally students are offered 20 credits of optional modules that support the projects s/he has selected.

The employed specialisation scheme allows students to gain a multifaceted expertise and knowledge. The knowledge gained is practical since their industrial training is in the selected specialism; it is theoretical with two modules enhancing the theoretical background; it is research informed since the design project is informed by findings resulting from the research project; and finally it is applied since students employ all their knowledge in an integrated design project.

1.5.2 What will I study?

Degree Year 1

Students acquire Basic Science modules such as: Engineering Mechanics, Chemistry, Mathematics and Physics. Additionally and a module in computer programming are offered as well as modules in English. In addition to guidance and practice in the basic skills of drawing, especially those needed for professional construction and civil engineering work. An introduction to the technological aspects, construction sequence, health and safety issues, and management procedures of simple buildings is also provided. Material science relevant to civil engineers and properties of construction materials are also introduced. Students also acquire an understanding of surveying instrumentation together with observation techniques and limitations. Consequently, programming techniques and computer applications in civil engineering are provided. Finally, the year one civil engineering student is introduced to basic research and communications skills.

Degree Year 2

Students continue acquiring understanding the basic concepts of soil mechanics, the fundamental principles of engineering geology, and fluid mechanics. Students start to investigate structural responses with respect to stresses and strains. Consequently, basic knowledge required to employ CAD tools in the design. Construction Technology methods is also studied to provide students with necessary knowledge of construction equipment, productivity, and impact on the construction planning schemes. Students continue to explore basics of Hydraulic engineering, behaviour of construction materials, Geotechnical Engineering and Advanced Surveying . Finally, students start acquiring basic design skills of concrete elements.

Degree Year 3

Students will learn the most important aspects of design, construction and maintenance of water distribution networks, drainage and sewerage systems with particular attention to hydraulic structures. Advanced design of steel and concrete structures is covered in addition to water and wastewater treatment, transportation systems. Analytical techniques required for the analysis of elastic indetermined structures, are also provided. Finally, Quantity Surveying, Estimation and Specifications is introduced. Additionally 2 option modules are offered in terms of Introducing and preparing students for their Graduation Project in Year 4.

Degree Year 4

Students are required to accumulate all their gained knowledge through a graduation project in one of the main areas of civil engineering, i.e. structural engineering, water engineering, construction management, environmental civil engineering and transportation engineering. The project comprises a research component in addition to a design component.
The main idea is to provide means of concentration within civil engineering by implementing 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 projects.

Other advanced modules are also considered in geoinformatics, foundations, water structures and advanced concrete design.

1.0 THE FACULTY OF ENGINEERING

1.5 Civil Engineering

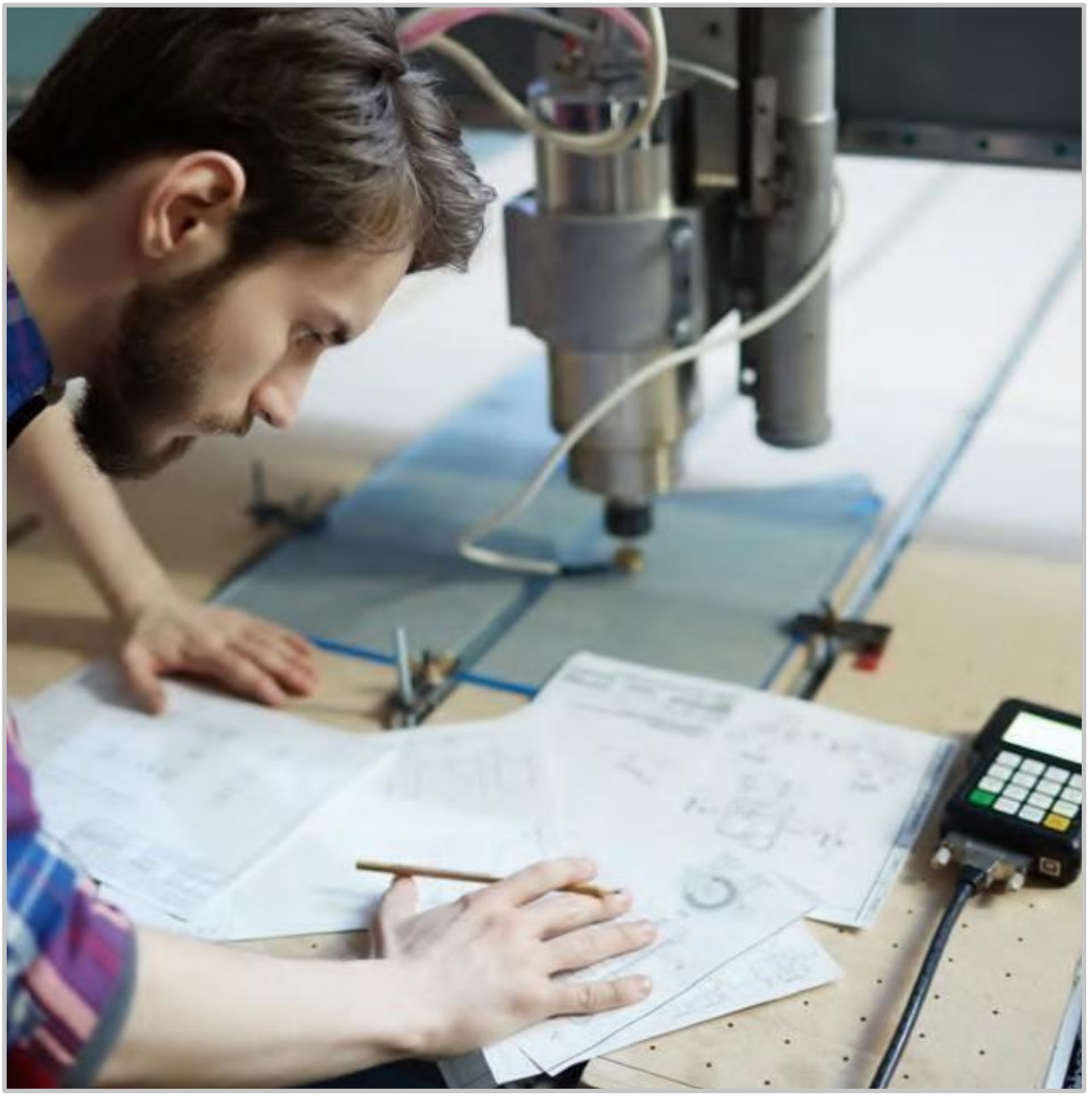
1.5.3 How will I learn and be assessed?

The Programme of Civil Engineering has implemented, since its start in 2006, a variety of assessment methods such as problem solving, in-class group assessments, group lab work, in-class computer developments and detailing and group design projects. The programme emphasises hands-on practical and field work to enhance the students' appreciation and understanding of technical and theoretical concepts. Students are required to engage in two industrial internships in the summer of Years Two and Three which expose them to environments of real construction projects and design office settings and procedures.

The programme also enhances research and communication skills of its graduates through a variety of research assignments.

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

Civil Engineering provides a career in structural design, construction and project management and control, bridge design and construction, roadway and runway design and construction, irrigation works and structures design and construction.



1.0 THE FACULTY OF ENGINEERING

1.6 Construction Engineering and Management

1.6.1

The programme is designed to provide a comprehensive education in the principles of management, business procedures, and human behavior necessary for planning and managing construction projects. The curriculum includes a diverse range of courses that cover advanced construction technology, infrastructure asset management, contracts and claims, human resources, project monitoring and evaluation, and financial/economic management, among others. The learning environment of the programme is enhanced through a blend of theoretical knowledge and practical application, including hands-on industrial training placements, innovative construction methods, and digital technologies like Building Information Modelling (BIM) and AI applications. This approach ensures that graduates are capable of making significant contributions to the construction industry and are prepared to tackle complex construction projects effectively. The main benefit of the programme is to provide one that meets the educational requirements of all appropriate professional institutions, both national and in the UK, for Membership / Chartered Engineer status, respectively.

1.6.2

Degree Year 1

In the first year of the current CEM programme at BUE, students acquire foundational knowledge and skills essential for the field. Courses cover surveying, construction drawing, and engineering mechanics, providing practical skills in site assessment and structural analysis. They also gain a solid grounding in engineering physics and chemistry, learning about material properties and physical laws relevant to construction. Mathematics courses ensure strong quantitative problem-solving abilities, while computer programming introduces computational techniques. Additionally, courses in English for Academic Purposes and Technical Writing enhance students' communication skills, enabling them to effectively articulate technical information.

Degree Year 2

In the second year of the CEM programme at BUE, students gain advanced technical and analytical skills. They learn to apply statistical methods in civil engineering through Statistics for Civil Engineers and deepen their understanding of structural behavior in Structural Analysis and Mechanics (1) and (2). Construction Economics introduces financial principles for managing construction projects, while Fluid Mechanics and Hydraulics cover fluid behavior in engineering contexts. Construction Drawing (2) enhances drafting skills with Civil 3D and BIM techniques. Properties & Testing of Construction Materials and Soil Mechanics focus on evaluating materials and understanding soil properties for foundation design. Reinforced Concrete Design teaches the principles of designing reinforced concrete structures. Additionally, Construction Management (1) covers project management methodologies, and Construction Technology & Building Services explores modern construction methods and building services integration.

Degree Year 3

In the third year of the CEM programme at BUE, students gain in-depth practical and theoretical knowledge crucial for advanced construction practices. The Industrial Training Placement (1) bridges academic learning with real-world experience, while Structural Steel Design for Construction Engineers focuses on designing and analyzing steel structures. Quantity Surveying, Estimation, and Specifications provide precise skills in cost estimation and project documentation. Advanced project management techniques are covered in Construction Management (2), alongside legal aspects in Construction Contracts. Students delve into the design, operation, and maintenance of water infrastructure in Water Distribution and Sewerage Systems, and explore urban and regional planning in Transport Systems & Planning. Innovative construction technologies are introduced in Smart Structures, while Rehabilitation and Retrofitting of Structures focus on enhancing the safety and functionality of existing buildings. Water Resource Management teaches sustainable strategies, and Foundation Engineering for Construction Engineers covers robust foundation design. Construction Equipment selection and use, conflict resolution in Claims & Disputes, and digital project visualization through BIM are also key components. Sustainable waste management practices, GIS and remote sensing technologies, environmental impact, and the design and maintenance of coastal and water treatment infrastructure round out this comprehensive curriculum, equipping students with the expertise to lead and manage complex construction projects effectively.

Degree Year 4

In the final year of the CEM programme at BUE, students gain advanced knowledge and practical skills crucial for professional success. The Graduation Research Dissertation and Graduation Construction Project foster critical thinking and problem-solving through in-depth research and real-world project simulation. Each student throughout the year has to conduct both an individual research report on a specific related topic and a group project where students simulate a real-life project with the application of all skills gained during their study in the programme. Courses like Value and Risk Management in Construction teach risk assessment and mitigation to ensure project value, while Sustainability and the Built Environment emphasize eco-friendly construction practices. Introduction to Simulation and AI Applications in Construction introduces cutting-edge technologies for optimizing construction processes, and Advanced Construction Technology Methods cover innovative construction techniques. Infrastructure Asset Management focuses on maintaining and optimizing infrastructure assets, and Human Resources Management in Construction equips students with effective workforce management strategies. Project Monitoring and Evaluation develop skills in assessing project impact, and Entrepreneurship and Start-ups encourage innovation and business acumen. Quality Management in Construction emphasizes standards and continuous improvement, while Management of Multiple Construction Projects covers the coordination of concurrent projects. Railway Engineering provides specialized knowledge in rail infrastructure, and Financial Management in Construction teaches financial planning, budgeting, and financial analysis.

How will I learn and be assessed?

Student learning is assessed through a variety of rigorous methods. These include assignments, projects, mid-term and final exams, practical exams, and laboratory work, which evaluate both theoretical knowledge and practical skills. In the final year, students undertake a Graduation Research Dissertation and a Graduation Construction Project, requiring the application of cumulative knowledge to complex engineering problems. Additionally, presentations and oral exams assess communication skills, while class participation and attendance reflect student engagement. Continuous assessment methods, such as quizzes and in-class activities, provide ongoing evaluation throughout the semester, ensuring a comprehensive and professional assessment of students' capabilities in preparation for their future careers.

.6.4

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

Upon graduation from the Construction Engineering and Management (CEM) program at the British University in Egypt (BUE), a wide range of career and further education opportunities are available. Examples but not limited to career opportunities are project planner, Site Engineer, Quantity Surveyor, Structural Engineer, (BIM) Engineer, contact administrator, facility management engineer, Infrastructure Asset management engineer, water/environmental specialist, monitoring & evaluation specialist, and feasibility studies for construction specialist, quality specialist, safety engineer, and project controls engineer.

1.0 THE FACULTY OF ENGINEERING

1.7 Electrical and Communications Engineering

1.7.1 Why study Electrical and Communications Engineering

The world we live in has dramatically changed due to the evolution of high-speed communication systems and the widespread of mobile devices, which has created an increased demand for highly qualified engineers to operate, maintain, design, and implement such systems.

The electrical engineering and communication programme (EEC) is designed to provide the students with a balanced learning experience supported by the essential theoretical background with emphasis on the practical skills in laboratories and mini projects to prepare the students to become tomorrow's professional engineers who can shape the future.

Whether you want to work in an electronic devices design firm or in a mobile communications company, in giant corporations like Intel and Google or in a start-up company; the EEC programme is the place for you, it offers a world-class student-centred learning experience with a cutting edge in research, design, and development of components and systems that power the future.

1.7.2

Degree Year 1

Besides completing a number of credits to fulfil parts of the general education requirements such as report writing and English language modules, this foundation year prepares students for the programme related subjects through a number of introductory specialized modules such as electric circuits, solid state electronics and computer programming. In addition, the foundation year provides students with the fundamental mathematical and physical concepts that are required to underpin programme related concepts.

Degree Year 2

In the second year of the programme, students will be exposed to more fundamental specialized modules such as electronics, electromagnetic fields, logic design, signals and systems and control system design. In addition to these core technical modules, students will also acquire essential skills in project management and corresponding technical standards of electrical and communications engineering. Moreover, students will continue to enhance their mathematical skills through modules such as calculus and differential equations.

Degree Year 3

Moving to the third year in the programme, students will now be exposed towards more specialized modules about computer architecture, microwave engineering, analog and digital communications systems, embedded systems, and optical communications. Furthermore, the students will continue to acquire applied skills in mathematics to help in understanding core concepts through modules such as probability, discrete mathematics and applied numerical techniques.

Degree Year 4

In their final year of study, the focus is on a set of electives in the students' chosen area of specialization or interest, as well as participation in a graduation design project, and graduation research project. The EEC programme offers a wide range of cutting-edge elective modules in specialized topics such as artificial intelligence (AI), nanoelectronics and organic electronics, deep learning, embedded control system, optical communications systems, and digital signal processing.

1.0 THE FACULTY OF ENGINEERING

1.7 Electrical and Communications Engineering

1.7.3 How will I learn and be assessed?

Different types of teaching and learning methods are used. This includes lectures, tutorials, group work, private study, as well as practical activities. As for assessment, this might involve in-class tests, mini-projects, presentations, and final unseen examinations. The criteria for expected outcomes of these assessments are provided. Feedback on assessment is also provided to students for future guidance about past performance by personal interaction, model answers and personal written advice about shortcomings. We have an open-door policy where students are encouraged to come and interact about their technical and personal problems. Students are also required to obtain internships so they may gain experience about professional and personal expectations in a nonacademic environment.

1.7.4

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

On graduation, you will have up-to-date knowledge of the latest advances and developments in the field of electronics and communications technologies. The programme graduates are usually recruited in companies covering a wide range of specializations such as Artificial Intelligence (AI), Information and Communications Technologies (ICT), mobile services and operators, embedded systems, wireless and optical communications and networks, and mixed analog circuit design. On the other hand, you may have an appetite for further education at Master or PhD level, where the department is offering a master program in Information and Communication Engineering.

1.0 THE FACULTY OF ENGINEERING

1.8 Computer Engineering (CE)

1.8.1 Why study Computer Engineering (CE) at the BUE?

Did you ever wonder how does your virtual assistant “Siri” or “Alexa” understand your spoken words and act accordingly? Or how does Facebook recognize faces in a picture? Are you eager to dive into computer algorithms, big data, and cloud computing? Do you aspire to learn about computer vision and how do autonomous vehicles recognize their surroundings?

The computer engineering programme (CE) is designed to provide the students with a balanced learning experience supported by the essential theoretical background with emphasis on the practical skills in laboratories and mini projects to prepare the students to become tomorrow’s professional engineers who can shape the future.

Whether you want to work in an embedded systems design company or in a firm that build machine learning systems, in giant corporations like Google and Facebook, or in a start-up company that works on autonomous vehicles; CE programme is the place for you, it offers a world-class student-centred learning experience with a cutting edge in research, design, and development of computer-based systems, software as well as hardware engineering that power the future.

1.8.2 What will I study?

Degree Year 1

Besides completing a number of credits to fulfil parts of the general education requirements such as report writing and English language modules, this foundation year prepares students for the programme related subjects through a number of introductory specialized modules such as computer programming and software design as well as data structure and algorithms. In addition, the foundation year provides students with the fundamental mathematical and physical concepts that are required to underpin programme related concepts.

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Degree Year 2

In the second year of the programme, students will be exposed to more fundamental specialized modules such as software engineering, operating systems, database systems, automation and control systems, and signal processing. In addition to these core technical modules, students will also acquire essential skills in project management and corresponding technical standards of computer engineering. Moreover, students will continue to enhance their mathematical skills through modules such as calculus and differential equations.

Degree Year 3

Moving to the third year in the programme, students will now be exposed towards more specialized modules about microprocessor design, design of algorithms, embedded systems design, and internet programming. Furthermore, the students will continue to acquire applied skills in mathematics to help in understanding core concepts through modules such as probability, discrete mathematics and applied numerical techniques.

Degree Year 4

In their final year of study, the focus is on a set of electives in the students’ chosen area of specialization or interest, as well as participation in a graduation design project, and graduation research project. The CE programme offers a wide range of cutting-edge elective modules in specialized topics such as artificial neural networks, quantum computing, high-performance computing, parallel and distributed computing, computers and networks security, data mining and big data, AI-based models, pattern recognition, and multimedia systems. Moreover, students have the opportunity to integrate cutting-edge technologies such as Artificial Intelligence (AI) into their graduation projects.

1.0 THE FACULTY OF ENGINEERING

1.8 Computer Engineering (CE)

1.8.3 How will I learn and be assessed?

Different types of teaching and learning methods are used. This includes lectures, tutorials, group work, private study, as well as practical activities. As for assessment, this might involve in-class tests, mini-projects, presentations, and final unseen examinations. The criteria for expected outcomes of these assessments are provided. Feedback on assessment is also provided to students for future guidance about past performance by personal interaction, model answers and personal written advice about shortcomings. We have an open-door policy where students are encouraged to come and interact about their technical and personal problems. Students are also required to obtain internships so they may gain experience about professional and personal expectations in a nonacademic environment.

1.8.4

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

On graduation, you will have up-to-date knowledge of the latest advances and developments in the field of electronics and communications technologies. The programme graduates are usually recruited in companies covering a wide range of specializations such as software development, software testing and verification, digital IC design, data analytics, embedded AI, cybersecurity, and quantum computing. On the other hand, you may have an appetite for further education at Master or PhD level, where the department is offering a master program in Information and Communication Engineering.

1.0 THE FACULTY OF ENGINEERING

1.9 Mechanical Engineering

1.9.1

The Mechanical Engineering Department graduates general Mechanical Engineers with possible optional concentration in one of the following specialisations: Materials, Production & Design, Power & Energy, Industrial Engineering, and Mechatronics and Control. The concentration is achieved in the last two years through 5 optional modules and two graduation projects. However, the student may decide to take a mix of optional modules in different areas.

The strong academic background is supported by nine modern laboratories and two machine shops containing state-of the-art equipment and resources necessary to gain hands-on experience in mechanical engineering. Moreover, students gain practical experience through two industrial training sessions during the summers of second and third years.

The Mechanical Engineering Department has several student organizations in which students participate in social, sports, and other extra-curricular activities. Mechanical Engineering students participate in international competitions in robotics and electric cars.

1.9.2

Degree Year 1

Mechanical Engineering Students will enhance their basic knowledge of Mechanical Engineering Fundamentals and consolidate their skills through studying 12 compulsory modules distributed over two semesters, namely, English for Academic Purposes, Mathematics 1, Linear Algebra, Engineering Physics, Engineering Mechanics, Mechanical Graphics 1, English for Technical Writing, Mathematics 2, Engineering Chemistry, Computational Analysis, ThermoFluid Mechanics, Mechanical Graphics 2.

Degree Year 2

Students will study 12 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: Fluid Mechanics, Fundamentals of Materials Science, Quality Control, Electrical Circuits and Machines, Engineering Economics, Mathematics 3.

In addition, students study Thermodynamics, Materials Engineering, Stress Analysis, Manufacturing 1, Applied Numerical Analysis, Project Management and Report Writing.

Degree Year 3

Students study an optional module plus a set of 11 compulsory modules distributed over two semesters. These modules are: Mechanics of Machinery, Design of Machine Elements, Condition Monitoring of Machinery, Heat and Mass Transfer, Structure Mechanics, Manufacturing 2, Industrial Safety, Machine Design, Renewable Energy Systems, Mechatronics Systems, Sustainable Product Design, and an optional module.

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

In this year, the Mechanical Engineering Programme emphasizes industrial applications as well as the development of research skills. In addition to two year-long graduation projects and four optional modules, students study four core modules (Design and Analysis of Experiments, Automatic Control, Operations Management, and Thermal Equipment).

Students may choose to take the optional modules in different fields or select one of the following focus areas: Materials, Production & Design, Power & Energy, Industrial Engineering, and Mechatronics and Control. Students will be guided to choose the optional modules and graduation projects in these areas.

1.0 THE FACULTY OF ENGINEERING

1.9 Mechanical Engineering

1.9.3 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.

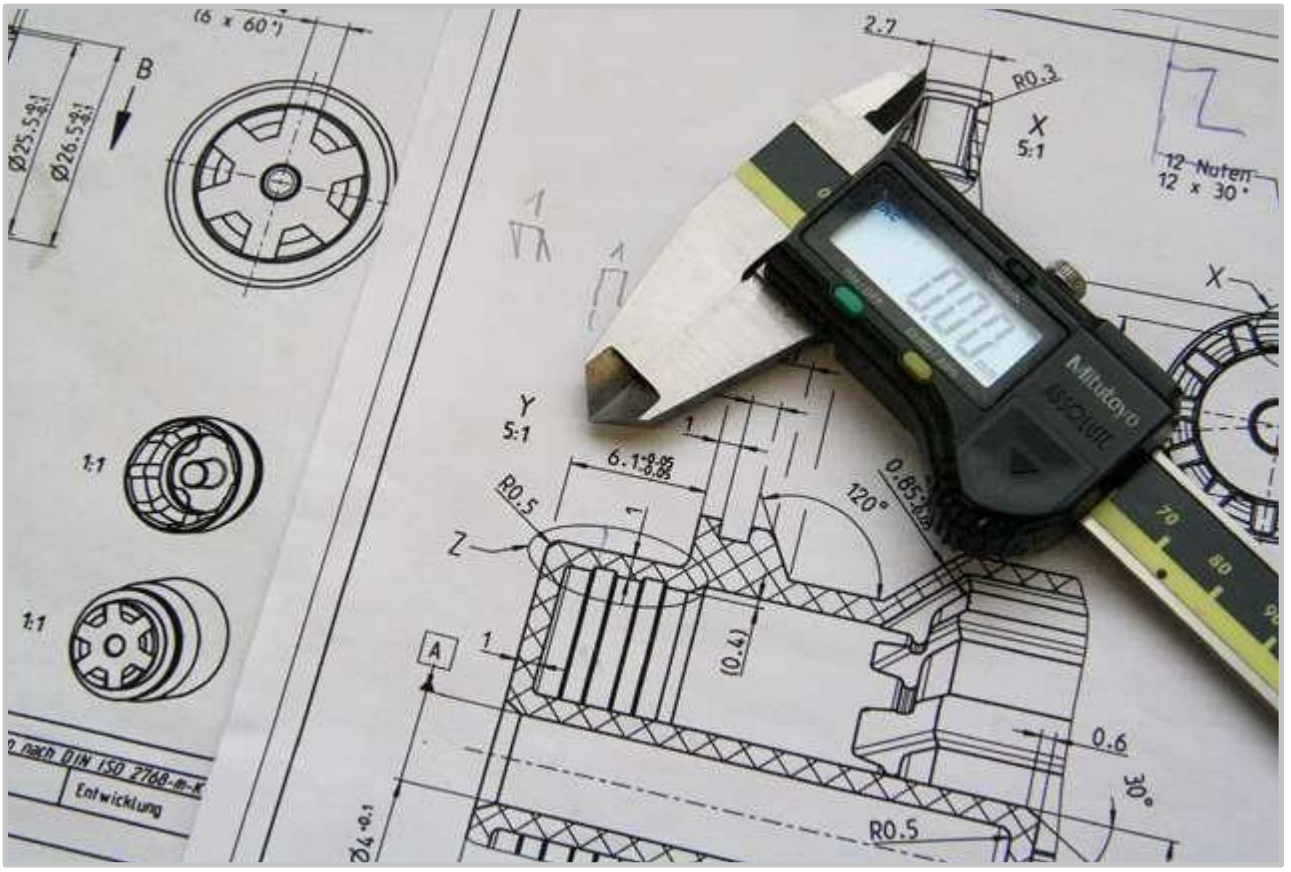
Students are also required to conduct two industrial internships during the summers of Degree Years 2 and 3.

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

After graduation, students have job opportunities including the design, manufacture, and maintenance of systems and equipment in many fields including:

Oil & Gas Industry, Petrochemicals Industry, Power Plants, Water Desalination Plants, Metal Forming Industry, Heavy Machinery, Air Conditioning, Refrigeration, Aerospace Industry, Automotive Industry, Packaging (Computer & Electronics), Food Industry, Textile Industry, Building Materials Industry, Government, Armed Forces, Management and Sales, and Research & Development.

Students who are interested in pursuing their studies may register for MSc programmes at the BUE (Renewable Energy or Advanced Materials) or any national university. Also, students can continue their postgraduate studies abroad.



1.0 THE FACULTY OF ENGINEERING

1.10 Mechatronics Engineering

1.10.

The Mechatronics Engineering Programme is a multidisciplinary programme integrating mechanical design, electronics, control and programming. It provides students with the interdisciplinary approach necessary to achieve the coherent integration of these traditionally divided disciplines.

By studying Mechatronics Engineering, you are taught the basics of electrical and mechanical systems. Through modules such as Thermodynamics, Material engineering and Electric circuit, you develop a knowledge of the existing thermodynamic cycles and electric circuits. You are also taught the basics of renewable energy, and the potential it holds in the future. You are also taught about Production & Design, Materials & Manufacturing.

Within this specialisation, you are focused on methods and tools of manufacturing. You develop an understanding of how products are designed, how suitable materials for production are selected, and the series of processes needed to produce it. You will also learn how electrical and mechanical components may be integrated to yield a comprehensive product.

1.10.2 What will I study?

Degree Year 1

The year is preparing students for foundation subjects in the major by taking Academic English, Mathematics, Physics, Chemistry, Mechanics, modules. Students also study the basic concepts of Mechanical Engineering: Manufacturing Engineering, and Mechanical Graphics. These are essential skills for future careers and life-long learning.

Degree Year 2

Provides students with the fundamentals of Mechatronics Engineering. These includes modules covering: Electric Circuits, Programming in C, and Electronic Circuits. These are supplemented by fundamental courses of Mechanical Engineering including: Material Engineering, Strength of Material, Thermodynamics, Project Management and Report Writing, Design of Machine Elements, Fluid Mechanics, Engineering Economics and Mechanics of Machinery.

Degree Year 3

Students in this Year will be more motivated and excited as they will find out the applications of what they have learnt so far. Modules this year offer outstanding preparation for hands-on practical work.

The modules offered cover: Digital Circuits, Automatic Control, Measurements and Instrumentation , Electric Actuators, Advanced Programming Languages, Industrial Internet of Things, Applied Microcontroller Systems, Modelling of Dynamic Systems, Industrial Process Control, Pneumatic and Hydraulic Actuators, Artificial Intelligence for Engineering, and Introduction to Robotics.

Degree Year 4

The focus of the final Year is on deep specialisation in the area of Mechatronics Engineering. This is achieved through two compulsory graduation projects in line with all programmes within the Faculty of Engineering at the BUE. The first is the individual dissertation and the other is the group design project.

Deep specialisation is also achieved by each student selecting 7 optional courses out of 9 optional courses offered in degree year 3 (subject to availability). These are: Embedded Systems, Data Acquisition and Signal Processing, Mechatronics System Design, Digital Manufacturing, Autonomous Vehicle Guidance Systems, Mechatronics in Renewable Energy, Micro-Electromechanical Systems (MEMS), Flexible Manufacturing Systems, and Bio-Mechatronics.

To emphasis the importance of sustainable development, a compulsory core module is also offered in degree year 4. This covers the Sustainable Product Design and Manufacturing of Mechatronics systems.

1.0 THE FACULTY OF ENGINEERING

1.10 Mechatronics Engineering

1.10.3 How will I learn and be assessed?

Teaching involves a mix of lectures, tutorials, group work, private study and practical activities. A variety of assessment methods such as problem sets, in-class group assessments, individual and group lab work, in-class computer developments and detailing and group design projects and presentations for the projects.

The programme emphasise hands-on practical work to enhance the students' appreciation and understanding of technical and theoretical concepts. Students are required to engage in two industrial internships in the summer of Years Two and Three so they may gain experience about professional and personal expectations in a non-academic environment.

The programme also enhances research and communication skills of its graduates through a variety of research assign ments.

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

Mechatronics Engineers are analogous to jokers in a deck of cards. Whatever the industry you are interested, they will find jobs. Upon graduation, you will have all the basic tools you need to proceed in the specialisation you are interested in.

You will have a superb skill set that enables you to think critically, approach problems efficiently and have the capacity to acquire knowledge according to your needs.

Mechatronics engineers find themselves constantly challenged in the workplace. They usually have jobs that require constant development of one's skills and updating one's knowledge.

Mechatronics engineering graduates find employment within our region and in other parts of the world. Potential employment sectors include: Automation Engineer, Control System Design, Embedded Systems Engineer, Renewable Energy Engineer, Automotive Engineer, Oil and Gas Engineer, and Construction site Engineer. Some of our graduates continue their education at the masters and doctoral levels.

1.0 THE FACULTY OF ENGINEERING

1.11 RoboticsEngineering

1.11.

The Robotics Engineering Programme is a multidisciplinary programme integrating mechanical design, electronics, control and programming. It provides students with the interdisciplinary approach necessary to achieve the coherent integration of these traditionally divided disciplines.

By studying Robotics Engineering, you are taught the basics of electrical and mechanical systems. Through modules such as Thermodynamics, Material engineering and Electric circuit, you develop a knowledge of the existing thermodynamic cycles and electric circuits. You are also taught the basics of renewable energy, and the potential it holds in the future. You are also taught about Production & Design, Materials & Manufacturing. Within this specialisation, you are focused on methods and tools of manufacturing. You develop an understanding of how products are designed, how suitable materials for production are selected, and the series of processes needed to produce it. You will also learn how electrical and mechanical components may be integrated to yield a comprehensive product.

1.11.2 What will I study?

Degree Year 1

Year 1 prepares students for foundation subjects in the major by taking Academic English, Mathematics, Physics, Chemistry, Mechanics, modules. Students also study the basic concepts of Mechanical Engineering: Manufacturing Engineering, and Mechanical Graphics. These are essential skills for future careers and life-long learning.

Degree Year 2

Year 2 provides students with the fundamentals of Mechatronics Engineering. These include modules covering: Electric Circuits, Programming in C, and Electronic Circuits. These are supplemented by fundamental courses of Mechanical Engineering including: Material Engineering, Strength of Material, Thermodynamics, Project Management and Report Writing, Design of Machine Elements, Fluid Mechanics, Engineering Economics and Mechanics of Machinery.

Degree Year 3

Students in Year 3 will be more motivated and excited as they will find out the applications of what they have learnt so far. Modules in this year offer outstanding preparation for hands-on practical work.

The modules offered cover: Digital Circuits, Automatic Control, Measurements and Instrumentation , Electric Actuators, Advanced Programming Languages, Industrial Internet of Things, Applied Microcontroller Systems, Modelling of Dynamic Systems, Industrial Process Control, Pneumatic and Hydraulic Actuators, Artificial Intelligence for Engineering, and Introduction to Robotics.

Degree Year 4

The focus of Year 4 is on deep specialisation in Robotics Engineering. This is achieved through two compulsory graduation projects in line with all programmes within the Faculty of Engineering at the BUE. The first is the individual dissertation and the other is the group design project.

Deep specialisation is also achieved by each student selecting 7 optional courses out of 9 optional ccourses offered in degree year 3 (subject to availability). These are: Autonomous Vehicle Guidance Systems, Mobile Robotics, Soft Robotics, Machine Vision, Behavioral Robotics, Aerial Robotics, Submersible Robotics, Tele-Robotics, Bio-Inspired Robotics, and.

To emphasis the importance of sustainable development, a compulsory core module is also offered in degree year 4. This covers the Sustainable Product Design and Manufacturing of Mechatronics systems.

1.11 Robotics Engineering

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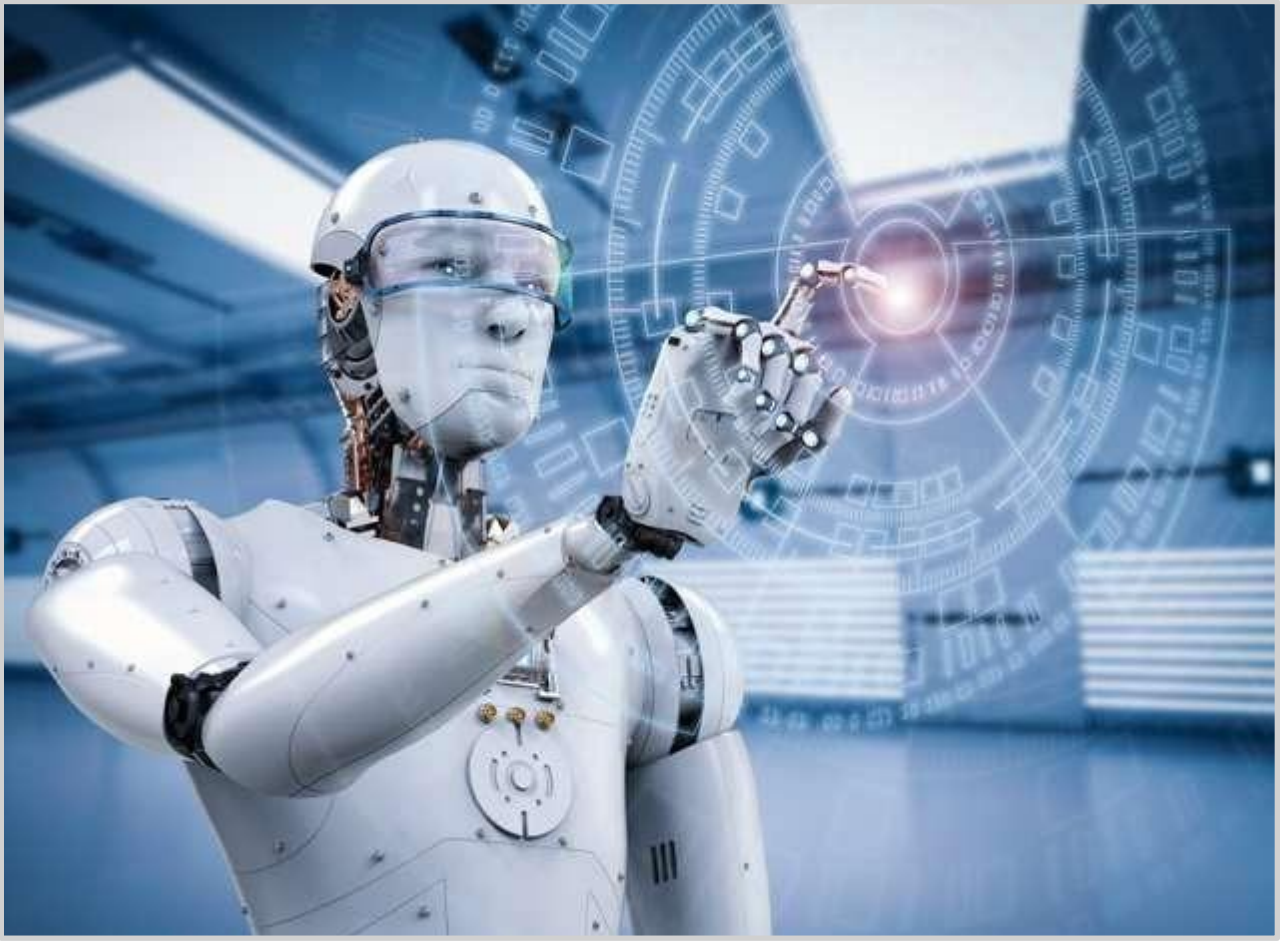
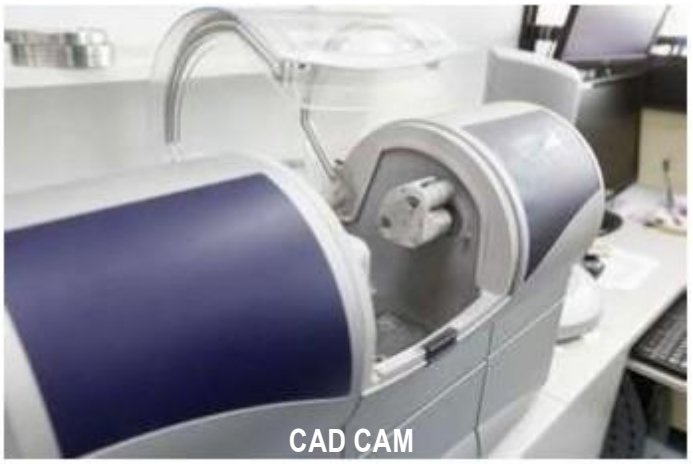
Robotics engineering graduates find employment within our region and in other parts of the world. Potential employment sectors include: Manufacturing companies, Food industries, Power Plants, Packaging Industries, Automotive companies Aerospace industries, Construction sites, and Military and Security establishments.

Students who are interested in pursuing their postgraduate studies may register for MSc and PhD programmes both nationally and internationally.





CAD CAM

Applied Energy Lab

Materials Lab

Applied Energy Lab 2

Environmental Lab

CAD CAM

Thermo and Fluids Lab

Surveying Lab