Undergraduate Studies

Engineering and Built Environment

UNIVERSITI TUNKU ABDUL RAHMAN

Architecture
Biomedical Engineering
Chemical Engineering
Civil Engineering
Construction Management
Electrical and Electronic Engineering
Electronic and Communications Engineering
Electronic Engineering
Electronics (Computer Networking)
Environmental Engineering
Industrial Engineering
Materials and Manufacturing Engineering
Mechanical Engineering
Mechatronics Engineering
Petrochemical Engineering
Quantity Surveying

Bachelor of Engineering (Honours) Biomedical Engineering (R2/524/6/0004)07/21(MQA/FA1045)

Biomedical Engineering is the application of engineering science and technology to solve problems in medicine and biology. It is also crucial in the design and development of medical equipment connected to health system and IT solution in the Healthcare Industries. Some of the applications include designing and producing artificial prosthesis and organs.

This programme aims to produce graduates who are knowledgeable in any or a combination of the following: engineering design, biomedical treatment (engineering) and diagnostics, mathematical modeling, computational techniques and programming which include web and database skills and bioformatics, biomedical signal processing, medical imaging, biomechanics and biomaterials and biology for biomedical engineering applications in the clinical and healthcare industries.

Career prospects
Biomedical Engineers may have job responsibilities such as designing new medical monitoring, diagnostic and therapeutic equipment, specifying setting-up and maintaining biomedical equipment, evaluating the safety, efficiency and effectiveness of equipment, planning data processing services and the development of associated computing programmes, analysing new medical procedures to forecast likely outcomes, designing and delivering technology to assist people with disabilities, and designing and developing equipment for medical imaging to display anatomical details or physiological functions. Biomedical engineering graduates may become advisors to marketing department of companies and even hold management positions.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Chemical Engineering (R2/524/6/0003)07/21(MQA/FA4697)

Chemical Engineering is the application of science, in particular chemistry, physics and mathematics, to the process of converting raw materials or chemicals into more useful or valuable products. Chemical engineers are engaged in the development and production of a diverse range of products, commodities and specialty chemicals. These products include high performance materials needed for aerospace, automotive, biomedical, electronic, military and environmental and health applications, which lead to a sustainable and improved quality of life. This programme covers the engineering principles required to develop, design, operate and control the processes and plants that involve molecular changes. It aims to produce graduates with the ability to apply the knowledge of science and engineering fundamentals in chemical engineering.

Career prospects
Chemical Engineers are very much at the forefront to improve the quality of life. There are extensive opportunities in the designing of process equipment/plants, identifying chemical and physical properties of substances, researching new products and ensuring equipment/plant operates optimally. They work in a wide range of fields such as design and construction, manufacturing, pharmaceuticals, pulp and paper, food processing, petrochemicals, healthcare, specialty chemicals, electronic and advanced materials, microelectronics, biotechnology, enviromental health and safety industries.

Duration of Study: **4 years** Mediums of Instruction **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Civil Engineering (R2/526/6/0098)07/27(MQA/FA4653)

Civil Engineering is the scientific study of the planning and construction of buildings, industrial infrastructures, roads and bridges. This programme concentrates on the practical application of technical knowledge (i.e. in mathematics and physical sciences, and their applications to all areas of civil engineering) to real-life and societal problems. Fieldwork is mainly related to planning, designing, constructing and maintaining public infrastructure or systems. It aims to produce graduates who demonstrate capabilities to acquire and apply knowledge of science and engineering fundamentals, possess in-depth technical competence in the civil engineering discipline to undertake problem identification, formulation and solution, possess the ability to utilise systems approach to design and evaluate operational performance.

Career prospects
Graduates are able to find employment as planners, construction managers, administrators, designers, investigation and research engineers and consultants.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Electrical and Electronic Engineering (R2/522/6/0049)07/27(MQA/FA9225)

Engineers are often responsible for designing and maintaining infrastructure such as the electrical power systems used by the general public, and in setting up their management structures and maintenance processes. This programme provides an opportunity for students to obtain knowledge on the latest technologies of electricity generation, transmission, distribution and state-of-the art electronics within the context of developing technology and human resources. It aims to train prospective engineers to design better systems and structures for better operational safety and efficiency.

Career prospects
Graduates can seek employment as Electrical or Electronic Engineer and Design Manager in Designing. They could also seek employment in the following areas: maintenance of electrical power system, electricity generation, transmission, distribution and utilisation; Electronic System for Operational Safety/Efficiency or Designing Renewable Energy System e.g. companies such as TNB, YTL Power and Schneider Electric.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Electronic and Communications Engineering (R/523/6/0268)03/21(MQA/FA9224)

Electronic and Communications Engineering is a multi-disciplinary programme which combines knowledge of science and fundamentals in electronics with communications engineering principles. Students will have the ability to undertake problem identification, formulation and solution, and utilise systems approach to design and evaluate operational performance. Industrial training and exposure are important components of the programme to equip graduates with the essential technical knowledge and skills required by a wide range of industries. Students will also be exposed to the essentials of management, business law and ethical engineering practices.

Career prospects
Graduates from this professional engineering programme may find employment in the electronic, communcation and electrical industries. They may be assigned to work in a wide variety of areas such as design and manufacturing of electrical and electronic products, operation and maintenance, research and development, sales and marketing, consultancy and education. Besides, they can also serve in the popular telecommunication sector including cellular phone, radio and television, telephony and satellite communcations.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Electronics (Computer Networking) (R/523/6/0298)03/21(MQA/FA0272)

This is an unique engineering programme with a very practical and applied focus. Building on the fundamentals of electronic device operation, students are guided to practical applications of these principles in the design, operation and maintenance of cutting-edge, global communication networks, exemplified in particular by the internet. Fundamental electronic engineering principles such as circuit theory and electromagnetics, are combined at a later stage with more network-centric subjects such as router configuration and maintenance, and network programming.

This practical focus is further augmented by a period of compulsory, supervised industrial training which provides ample opportunities for students to consolidate their classroom-based learning experiences. Students will also be exposed to the essentials of management, business law and ethical engineering practices. The synergistic blend of fundamentals and practical applications in the syllabus coverage makes it uniquely positioned to provide students with a set of engineering skills that will be highly in demand in the rapidly evolving arena of information communication technology.

Career prospects
Due to the unique intersection of technologies covered in this course, graduates from this programme will have a wide range of career options open to them. This includes, but not limited to, IT consultants, network designers, network administrators, communications system developers, network security architects, IT security specialists, network engineers, network managers, design and manufacturing of electrical and electronic products, operation and maintenance of factories, research and development, consultancy and education.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Electronic Engineering (R2/523/6/0306)01/26(MQA/FA4541)

This programme is designed to equip students with a sound knowledge of the principles of physics, mathematics, technology and electronic engineering. The major study areas are electronic, circuit theory, computer architecture and networks, software, communication engineering, signal processing, integrated circuit design, power, control and instrumentation.

Students will be exposed to the essentials of management and ethical engineering practices. They will be trained to be professional engineers with the knowledge and skills to meet the needs of the industry and the nation. To consolidate the learning experience and application of theoretical knowledge, students will be placed under a supervised industrial training programme and assigned on-the-job responsibilities. This experience will prepare them for their final phase of study and enhance their future employability.

Career prospects
Graduates may find employment in the following industries: electrical and electronic, computer and communication - in a wide variety of areas ranging from the design and manufacturing of electrical and electronic products, operation and maintenance of plant and factory, research and development, telecommunication and information technology systems, production process control, quality assurance and control, sales and marketing, consultancy and education.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Kampar**

Bachelor of Engineering (Honours) Environmental Engineering (R2/526/6/0078)06/26(MQA/FA9150)

Environmental Engineering is the scientific study to apply engineering principles to improve our environment (air, water, land and natural resources), to provide healthy water, air and land for human habitation and for other organisms, and to remediate polluted sites, it includes the planning and construction of water and wastewater treatment plants, buildings, and industrial infrastructures.

This programme concentrates on the practical application of technical knowledge (i.e. in mathematics and physical sciences, and their applications to all areas of environmental engineering) to real-life and societal problems. Fieldwork is mainly related to planning, designing, constructing, maintaining and improving the environment. It aims to produce graduates who can demonstrate capabilities to acquire and apply knowledge of science and engineering fundamentals, possess in-depth technical competence in the environmental engineering discipline to undertake problem identification, formulation and solution, and possess the ability to utilise a system approach to design and evaluate operational performance.

Career prospects
Graduates are able to find employment as environmental engineer, environmental planners, environmental-related construction managers, administrators, designers, investigation & research engineers, sales engineers and EIA (Energy Information Administration) consultants.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Kampar**

Bachelor of Engineering (Honours) Industrial Engineering (R2/521/6/0091)01/27(MQA/FA11191)

Industrial Engineering is a flexible engineering area that helps company to save money and enhance efficiency. It is a multidisciplinary field related to the manufacturing, design, improvement and installation of integrated systems of people, materials, information, equipment and energy.

In addition, the knowledge learned from industrial engineering can apply on streamlining an operating room, distributing products worldwide and others. This is due to the industrial engineering draws upon specialised knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems.

Career prospects
Industrial engineers can involve themselves in designing, developing, testing, and evaluating integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Kampar**

Bachelor of Engineering (Honours) Materials and Manufacturing Engineering

(R2/540/6/0013)07/27(MQA/FA9227)

Materials Engineers investigate how different materials can be most usefully applied in society whilst manufacturing engineers take raw materials and basic components and turn them into products.

This programme offers education and research for the development and application of new materials. It aims to provide graduates with an in-depth knowledge and understanding of the characteristics of various materials that are vital for Malaysian industry to adopt innovative manufacturing processes to give local products a competitive edge in the world market.

It applies principles of the sciences and engineering to understand the characteristics of materials and manufacturing processes. Thus, this programme contributes to the scientific knowledge and bridges the gap between modern chemistry and physical mass, and between manufacturing technology and mathematical analysis. The course structures and syllabuses are designed for graduates to be equipped with the essential technical knowledge and skills required by many companies and industries.

Career prospects
Graduates may seek employment in a wide range of manufacturing industries such as process engineering and quality control in most production lines, R&D in various industries, materials related research in multinational companies and research institutes, semiconductor fabrications, nanotechnology and nano-materials, special metals and composites, new ceramics, sustainable energy and fuel cells, etc.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Mechanical Engineering (R2/521/6/0106)06/27(MQA/FA9226)

Mechanical Engineering applies principles of sciences and engineering to understand the characteristics of mechanical engineering systems. As such, this programme contributes to scientific knowledge and bridges the gap between the fields of study like mathematical analysis, computational methods, engineering design and production.

The Mechanical Engineering programme seeks to combine excellence in education and research with service to society. This programme aims to provide graduates with an in-depth knowledge and understanding of the characteristics of the various state-of-art mechanical systems and devices.

The main objective of this programme is to produce engineering graduates with the ability to acquire and apply knowledge of science and engineering fundamentals as well as gain an in-depth technical competence in the mechanical engineering discipline. Students will also learn to function effectively as an individual and in a group with the capacity to be a leader or manager as well as an effective team member.

Career prospects
Graduates may seek employment in a wide range of manufacturing industries such as those concerned with the production of machine tools, robots, air-conditioning equipment and automotives. They can serve in a wide variety of positions such as production engineers, process engineers, design engineers, manufacturing engineers, quality assurance engineers, mechanical project consultants and research scientists.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Mechatronics Engineering (R2/523/6/0042)07/21(MQA/FA4789)

Mechatronics Engineering is an emerging field of engineering that integrates mechanical engineering, electronics, and computer engineering and information technology. It includes robotics and automation systems, precision engineering, micro electromechanical systems (MEMS) and many other leading-edge technologies. The core activities within mechatronics focus on the development and integration of intelligent sensors, industrial automations, robotics, actuators, microsystems and advanced decision-making and control strategies.

This programme is meticulously designed in response to the rapid growth of interest in mechatronics and precision engineering. It aims to produce graduates who can demonstrate capabilities as effective problem solvers and are knowledgeable in applying logical, critical and creative thinking to a range of challenges and problems. They will also display effective communication skills, be able to integrate well into the industry and contribute positively as a professional to the community.

Career prospects
Mechatronics engineers can work in any industry that develops, uses, designs or manufactures integrated and "smart" devices. Opportunities exist in manufacturing, research and even sales and marketing. Mechatronics devices consist of products used in medicine and surgery, agriculture, buildings, homes, automobiles, toys, intelligent aids for the elderly and the disabled, and in the entertainment industry. The UTAR Mechatronics Engineering focuses on the precision engineering that covers equipment making, tooling, precision products and precision processes.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Engineering (Honours) Petrochemical Engineering (R2/524/6/0039)06/26(MQA/FA11192)

Petrochemical Engineering is the application of science, in particular chemistry, physics and mathematics, to the process of converting raw materials of petroleum or other hydrocarbon origin into more useful or valuable products. They are engaged in the development and production of a diverse range of products, commodities and specialty chemicals. These products include high performance materials needed for aerospace, automotive, biomedical, electronic, military and environmental and health applications, which lead to a sustainable and improved quality of life. This programme covers the engineering principles required to develop, design, operate and control the processes and plants that involve molecular changes. It aims to produce graduates with the ability to apply the knowledge of science and engineering fundamentals in petrochemical engineering.

Career prospects
Petrochemical engineers are very much at the forefront to improve the quality of life. There are extensive opportunities in the designing of process equipment/plants, identifying chemical and physical properties of substances, researching new products and ensuring equipment/plant operates optimally. They work in a wide range of fields such as the oil and gas industry, petrochemicals, pharmaceuticals, pulp and paper, food processing, healthcare, specialty chemicals, electronic and advanced materials, microelectronics, biotechnology, environmental health and safely industries.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: Kampar

Bachelor of Science (Honours) Architecture (R2/581/6/0048)06/24(MQA/FA9610)

The Bachelor of Science (Hons) Architecture degree programme consists of various interdisciplinary subjects which would provide a good foundation in Building Design, Construction, History, and Architecture Theory. This programme has been designed with the objective of not only providing sound knowledge of architecture design, conceptual development, building construction, architecture detailing, structural design, building services, architecture history, graphic communication, presentation skills and computer studies but also developing creative and analytical thinking.

Career prospects
Graduates are able to work in the construction industry as assistant designer, project administrator, builder, or building materials supplier. They can also choose to further studies in other related fields.

Duration of Study: **3 years** Medium of Instruction: **English**

Campus: **Sungai Long**

Bachelor of Science (Honours) Construction Management (R2/526/6/0055)05/26(A9827)

This programme gives students a thorough understanding of the entire construction and development process, from the client's brief issued to the lead consultant followed by the design and planning stages to the construction, completion, occupation and maintenance of the facility. It's main areas of specialisation are construction technology, measurements and estimating, contract administration, construction project management and computer application in construction. Besides academic study, students are required to undergo a minimum of three months of practical training in the construction industry at the end of the second year and to further undertake a major project in the final year, which ensures the integration of all aspects of the programme they have acquired before their graduation.

Career prospects
There is always a great demand for competent construction and project managers both within the mainstream construction industry and in other related sectors. Graduates will possess the necessary knowledge and skills to work for building and civil engineering contractors, property developers, project management consultants, building materials manufacturers and suppliers as well as government authorities and agencies.

Duration of Study: **3 years** Medium of Instruction: **English**

Campus: **Kampar**

Bachelor of Science (Honours) Quantity Surveying (R2/526/6/0072)01/27(MQA/FA8841)

A Quantity Surveyor is a construction professional providing economic, cost and contractual advice on all aspects of the construction process. To be a professional, quantity surveyor requires a combination of technical, economic, legal and managerial skills. Thus, this is a professional programme that aims to equip the graduates with those skills.

This programme gives students a thorough understanding of the roles of a Quantity Surveyor in every stage of the construction and development process, from the project brief issued to the lead consultant through all the design and planning stages to the construction, completion, occupation and maintenance of the facilities so as to meet the objective of 'value of money'.

Besides academic study, students will undergo a minimum of six months of practical training in a quantity surveying firm or construction-related company. Students will further undertake a major project in the final year, which ensures the integration of all aspects of the programme acquired by the students before their graduation.

Career prospects
There is always a great demand for competent quantity surveyors both within the mainstream construction industry and in other related sectors. Graduates will possess the necessary knowledge and skills to work in quantity surveying firms or with project management consultants, building and civil engineering contractors, specialist contractors and property developers.

Duration of Study: **4 years** Medium of Instruction: **English**

Campus: **Sungai Long**

For more information, please contact

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