

Bachelor of Engineering (Hons) Chemical Engineering **KP/JPS(KA6777)07/11**

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. 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 chemical engineering.

Programme Objectives

The Programme Objectives describe the career and professional accomplishments that the Chemical Engineering programme would prepares the graduates to achieve in a few years after their graduation. Programme of Chemical Engineering should be able to:

1. Possess a working knowledge of mathematics, science and chemical engineering fundamentals, and have the ability to integrate these disciplines to function as competent chemical engineers in a wide range of industrial, professional and in postgraduate studies.
2. Exercise sensitivity to the humanistic value of their work, including ethical practices that address health, safety, environmental. Economic and societal issues.
3. Provide students with the understanding of the value of life-long learning and ability to engage in further growth through activities such as continuing education and technical training.
4. Prepare students to assume technical leadership and managerial positions in industrial that require their specialized knowledge of chemical engineering.

Programme Outcomes

Upon completing this programme, the student is expected to attain the following:

- i. Ability to acquire and apply knowledge of mathematics, science and engineering fundamentals in chemical engineering calculations or design
- ii. Acquired comprehensive technical competence in chemical engineering to design and conduct experiments, as well as to analyse and interpret data
- iii. Ability to identify, formulate, and solve engineering problems
- iv. Ability to use systems approach to chemical engineering design and evaluate the operational performance
- v. Ability to apply the chemical engineering principles of design for sustainable development
- vi. Understanding of professional and ethical responsibilities and commitment to them
- vii. Ability to communicate effectively in written, oral, and visual form, with engineers and the community at large
- viii. Ability to function effectively as an individual and in a group with the capacity to be a leader or manager
- ix. Understanding of the social, cultural, global and environmental responsibilities of a professional engineer
- x. Recognising the need to undertake life-long learning, and possessing / acquiring the capacity to do so.

Careers

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, environmental health and safety industries.

Subjects

Year 1

English for Engineering
Material Science
Statics
Computer Aided Design and Programming
Engineering Thermodynamics I
Introduction to Chemical Engineering
Fluid Mechanics I
Dynamics
Mathematics for Engineering I & II
Chemistry for Engineering
Chemical Engineering Thermodynamics
Heat and Mass Transfer

Year 2

Fluid Mechanics II
Engineering Materials
Circuit Theory
Numerical Methods and Statistics
Instrumental Analysis
Engineering Analysis
Unit Operation
Chemical Engineering Laboratory I
Chemical Reaction Engineering I
Chemical Process Control and Instrumentation
Particle Technology
Bioprocess Engineering
Law for Engineers
Basic Economics, Accounting and Management

Year 3

Environmental Science and Engineering
Chemical Reaction Engineering II
Chemical Engineering Laboratory II
Occupational Safety and Management
Process Optimization and Simulation
Engineer in Society
Industrial Training

Elective Engineering Related Subjects* (Choose 1 subject)

Project Management
Entrepreneurship
Engineering Economics

Year 4

Project
Renewable Fuel Energy
Process and Plant Design I
Process and Plant Design II

Elective Engineering Subjects* (Choose 2 subjects)

Catalysis and Catalytic Process
Petroleum Chemistry and Petrochemicals
Quality and Reliability Engineering
Food Processing Engineering
Membrane Technology
Water Supply and Wastewater Treatment
Polymer Science and Technology

*Subject to change/availability

MQA Subjects

Bahasa Kebangsaan/Foreign Language
Pengajian Malaysia
Pendidikan Moral/Pengajian Islam

University Subjects

Co- Curriculum
Sun Zi's Art of War and Business Strategies