



# BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS

[R/0711/6/0019] 05/28 [MQA/FA5713]

BEM/EAD/02-75/WA/04 (001)

## DURATION

**4 years**

## INTAKE

**February/April/September**

## MEDIUM OF INSTRUCTION

**English**

## ABOUT THE PROGRAMME

Chemical Engineering (ChE) is a well-recognised branch of engineering that applies the core scientific principles from chemistry, physics, and engineering to transform raw materials into valuable products. ChE encompasses the development of efficient and sustainable designs and operations for chemical processing plants, taking into account aspects such as techno-economic viability, operability, safety and risk analysis, as well as material conversion and recovery.

There is a strong demand for chemical engineers across diverse industries, including traditional sectors such as chemicals, polymers, oil and gas, food processing, waste and water treatment, and pulp and paper. Additionally, chemical engineers are highly sought after in sectors like electronics and semiconductors, consumer products, power generation, education and insurance. Emerging areas in ChE include green chemistry and sustainable practices, biotechnology and pharmaceutical development, renewable energy and storage technologies, advanced materials and manufacturing methods, nanotechnology, and the circular economy.

The ChE programme at Xiamen University Malaysia (XMUM) is accredited by the Engineering Accreditation Council (EAC) Malaysia and provides a comprehensive learning environment focused on quality teaching and research. The programme features state-of-the-art chemical engineering laboratories and a Simulation Integrated Process Plant (SIPP). The SIPP is the first teaching-focused simulated process plant in Malaysia, offering specialised training for chemical engineering students, particularly in process safety, control and instrumentation.

The ChE programme also incorporates elements of Artificial Intelligence and Industrial Revolution 4.0 (IR 4.0), and green and sustainable practices into its curriculum. In addition, the programme is supported by a team of highly qualified staff members who are experts in various research areas of chemical engineering, such as green and sustainable materials, process modelling and simulation, artificial intelligence, nanomaterials, membranes, and bioproduct development.



## PROGRAMME HIGHLIGHTS

- A programme accredited by the Engineering Accreditation Council (EAC) Malaysia and recognised by the Washington Accord
- A stimulating environment featuring excellent teaching and research laboratory facilities
- An opportunity for students to enhance their practical engineering skills using Malaysia's first Simulation Integrated Process Plant (SIPP)
- Curriculum designed to equip graduates with the essential skills needed for Industrial Revolution 4.0
- A variety of learning experiences that help students excel in green and sustainable practices

## CAREER OPPORTUNITIES

- Chemical engineer and researcher in
  - Oil and gas industry
  - Palm oil industry
  - Energy industry
  - Chemical and allied products
  - Healthcare/Pharmaceutical industry
  - Food industry
  - Biochemical/Bioenergy industry
  - Water industry
  - Material science
  - Health, safety and environmental engineering firms
  - Waste management
  - Electronics and semiconductor companies
  - R&D organisations
  - Consulting firms
  - Educational institutions etc.
- Professional consultant in government agencies, financial, insurance and risk institutions and business enterprises

## BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS

### ENTRY REQUIREMENTS

*\*For other equivalent qualifications, please consult our programme counsellor*

|  |   |
|--|---|
| STPM   | A pass in STPM with at least a Grade C (GP 2.0) in Mathematics AND Chemistry/Physics                            |
| A-LEVEL  | A pass in A-Level with at least a Grade C in Mathematics AND Chemistry/Physics                                  |
| UEC  | A pass in UEC with at least a Grade B in 5 subjects including Mathematics, Chemistry AND Physics                |
| Foundation/Matriculation (Science/in a relevant field) | A pass in Foundation/Matriculation with at least a CGPA of 2.0 out of 4.0 AND passes in Mathematics AND Physics |
| Diploma (in a relevant field)                          | A pass in Diploma with at least a CGPA of 2.5 out of 4.0 AND passes in Mathematics AND Chemistry/Physics        |

### MAIN COURSES

#### Year 1

- Chemical Engineering Drawing
- Introduction to Chemical Engineering
- Analytical Chemistry for Engineers
- Physical Chemistry
- Organic Chemistry
- Engineering Mathematics I & II
- Introduction to Biochemical Engineering
- Chemical Engineering Thermodynamics I
- Fluid Mechanics for Chemical Engineering

#### Year 2

- Unit Operations of Chemical Engineering I & II
- Chemical Engineering Thermodynamics II
- Heat Transfer
- Chemical Engineering Laboratory I & II
- Numerical Methods in Engineering
- Reaction Engineering
- Mass Transfer
- Materials Science for Chemical Engineering

#### Year 3

- Chemical Process Safety
- Chemical Process Technology and Design
- Process Control and Instrumentation
- Chemical Engineering Laboratory III
- Modelling and Simulation of Chemical Processes
- Plant Equipment Design
- Engineering Statistics and Optimisation
- Environmental Management
- Project Management and Economics
- Industrial Training

#### Year 4

- Research Project I & II
- Capstone Project I & II
- Engineers in Society
- **Major Elective (Choose 4)**

### Major Electives

#### Area 1 – Industrial Revolution 4.0 and AI

- Additive Manufacturing for Chemical Engineers
- Machine learning for Chemical Engineers
- IoT for Chemical Engineers
- Computational Fluid Dynamics
- Multiscale Modelling and Simulation

#### Area 2 – Green and Sustainable

- Nanomaterials
- Sustainable Chemical Engineering and Circular Economy
- Emerging bioprocess engineering

#### Area 3 – Engineering Technology

- Catalysis Technology
- Particle Technology
- Membrane Technology
- Oils and fats Technology

#### Area 4 – Chemical Engineering Process

- Simulation Integrated Process Plant
- Crude Oil Refining and Processes
- Process Safety Management

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The information in this brochure is correct at the time of publication. Xiamen University Malaysia (XMUM) reserves the right to change the information in line with updates from time to time. Please check the website (www.xmu.edu.my) for latest information.

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