

# Chemical engineering course outline

## **First year**

The first year of our programmes is broad in scope. The fundamentals of chemical engineering are introduced and you can learn about other engineering disciplines – or a foreign language. Transferable skills are developed and you have the opportunity to attend a residential course at our outward bound centre at Lake Coniston in the Lake District. IT skills are taught in our purpose-built computing facility.

Modules include:

- Modelling Concepts and Tools
- Fluid Flow, Thermodynamics and Heat Transfer
- Chemical Engineering Design and Professional Skills
- Properties and Applications of Materials
- Chemistry for Engineers
- Electrical, Electronic and Computer Systems
- Chemical and Biochemical Processes
- Other Engineering Modules or Modules Outside Main Discipline such as a Introduction to Energy Engineering or a language

**For those taking Chemical Engineering with Energy you take some of the above and:**

- Introduction to Energy Engineering

**For those taking Chemical Engineering with Business you take some of above and:**

- Business Organisation and Management
- Introduction to Financial Analysis
- Introduction to Economics
- International Economy

All Business modules are taught by Birmingham Business School

## **Second year**

Themes begun in the first year are developed to the standard you need as a professional engineer.

**Modules include:**

- Mass, Heat and Momentum Transport
- Process Integration and Unit Operations

- Liquid Mixing in Industrial Systems
- Process Systems Computing for Design
- Reactors and Catalysis
- Principles of Process Control
- Product Design Exercise
- Other Engineering Modules or Modules Outside Main Discipline such as or a language

**For those taking Chemical Engineering with Energy you take some of the above and:**

- Efficient Heat Engines and Heat Pumps
- Electrical Power
- Sustainable Development

**For those taking Chemical Engineering with Business you take some of above and:**

- Financial Decision Making
- Introduction to Marketing
- Human Resources Management
- Global Marketing

### **Third year**

The third year develops the chemical engineering fundamentals further, to graduate level. All students undertake an industry-linked design project which enables them to put into practice all of the skills they have gained.

**Modules include:**

- Design Project
- Processing for Formulation
- Chemical Engineering Thermodynamics
- Multiphase Systems
- Process and Project Management
- Environmental Engineering and Life Cycle Analysis
- Other Engineering Modules or Modules Outside Main Discipline, for example [Petrochemical Engineering](#) (PDF 2.9 MB)

**For those taking Chemical Engineering with Energy you take some of the above and:**

- Renewable Energy
- Energy Economics
- Advanced Conventional Energy
- Environmental Risk Assessment

**For those taking Chemical Engineering with Business you take some of above and:**

- Supply Chain Management
- Corporate Finance
- Strategic Management

#### **Fourth year (MEng)**

In the fourth year you can develop subjects taken in previous years to greater depth, and also take options in associated subject areas, such as biochemical, food and pharmaceutical engineering. You also undertake a research project through which you develop advanced laboratory and scholarship skills.

**Modules include:**

- Advanced Reaction Systems A
- Advanced Transport Processes
- Chemical Engineering Research Project
- Systems Modelling

**Options to be taken from:**

- Advanced Reaction Systems B
- Modern Genome Based Bioscience
- Marketing and TQM
- Business Methods Industrial Economics and Strategy
- Plant design and manufacturing principles in (bio) pharmaceutical production
- From bench to market, development of pharmaceutical drug products
- Design and development of drug delivery systems
- Powder handling and processing
- Hygienic food processing
- Developing food structure through thermal processing
- Minerals engineering – a modern perspective

**For those taking Chemical Engineering with Energy you take some of above and:**

- Sustainable Construction
- Energy Policy and Case Studies
- Individual Energy-related project

**For those taking Chemical Engineering with Business you take some of above and:**

- International and Industrial Economics
- Entrepreneurial and Small Business Studies

### **Year Abroad**

H801 and HW10 (International Study) students spend the third academic year studying at a prestigious university either in English at an English-speaking university (e.g., Melbourne, UCLA, Ontario, Montreal, Singapore or one of the Universitas 21 group, [www.universitas21.com](http://www.universitas21.com)) or at a non-English speaking university (eg, Madrid, Rome, or Nancy).

### **Year in Industry**

H802, H890, H891, HW10 and HV10 (Industrial Experience) students spend a year in industry after their second or third years. We have contacts with a large number of companies to assist you. Typically you will have to pass the interview process run by the company you are seeking a placement. The industrial placement gives you experience of working in the chemical engineering field which will enhance your CV and allow you to acquire further knowledge and employability skills.

### **Chemical Engineering with Foundation Year**

The Engineering Foundation Year is aimed at students who have the ability but not the knowledge to enter directly to Level C (Year 1) of normal BEng and MEng Engineering programmes. Such students will often have a mixed GCSE and AS Science/Mathematics background.

The BEng/MEng Chemical Engineering with Foundation Year programme ensures that students develop sufficient background knowledge in mathematics and chemistry (and other sciences as necessary) to allow them to continue to Year 1 of their chosen programme.

It is multidisciplinary, giving the student experience of team working with students from other disciplines. The Foundation Year also develops the student's computer literacy, and presentational skills.

Following the Foundation year a successful student can transfer to any of the BEng/MEng Chemical Engineering programmes.

### **Modules include:**

- Engineering and Science Mathematics A
- Engineering and Science Mathematics B
- Introduction to Mechanics
- Chemical Engineering 1
- Chemical Engineering 2
- Engineering Studies or English for International Students