ENGINEERING (BIOCHEMICAL)
MEng / UCAS CODE: H813
2019 ENTRY

www.ucl.ac.uk/prospectus
Biochemical engineering translates life science discoveries into new products and sustainable manufacturing processes. You will acquire the underpinning knowledge needed to produce biopharmaceuticals, make biofuels, manufacture vaccines or grow stem cells for therapy. The MEng offers an extra year on top of the Biochemical Engineering BEng to gain research experience and take advanced modules.

**Key information**

**Programme starts**
September 2019

**Location**
London, Bloomsbury

**Degree benefits**

- The department has one of the most modern and comprehensive biochemical engineering facilities of any university in the world. Valued at over £35 million, our facilities attract leading industrial collaborators from the biopharmaceutical, cell therapy and industrial biotechnology sectors.
- Our staff are at the forefront of research in areas such as regenerative medicine, biopharmaceuticals and biofuels. We are committed to research-based teaching through UCL’s Connected Curriculum, meaning students will be exposed to the newest developments in these fields.
- The programme is professionally accredited by the Institution of Chartered Engineers (IChemE). It provides the essential entry point to Chartered Engineering Status (CEng), and can be a stepping-stone to leadership roles in research or industry.
- We have been pioneers in providing our undergraduates with training to help them understand the business environment in which the life sciences operate. This will prepare you better for your future career.

**Accreditation**

This programme is accredited by the Institution of Chemical Engineers (IChemE) as satisfying the academic requirement for registration as a Chartered Chemical Engineer.

**Degree structure**

In each year of your degree you will take a number of individual modules, normally valued at 15 or 30 credits, adding up to a total of 120 credits for the year. Modules are assessed in the academic year in which they are taken. The balance of compulsory and optional modules varies from programme to programme and year to year. A 30-credit module is considered equivalent to 15 credits in the European Credit Transfer System (ECTS).

The Engineering (Biochemical) BEng and MEng share a common curriculum of core modules. These are designed to introduce you to biochemical engineering through lectures and tutorials, with a strong emphasis on hands-on learning activities, laboratory and pilot plant experience and immersive activities. Knowledge gained in the fundamentals will be applied to a Design Project for manufacture of a biological product in year three.

You can choose from a range of options for the MEng year. The final-year project enables students to undertake independent research in a choice of biochemical engineering fields.

The degree will be broken down into three main components:

- Discipline-specific material in biochemical engineering;
- Common engineering elements taught within the Faculty of Engineering Sciences; and
- Minor modules where you may choose from a range of subjects offered by the Faculty of Engineering Sciences.

MEng students may then choose to join one of the following additional routes: Bioprocess Management; Chemical Engineering; Study Abroad; or Year in Industry. The Study Abroad route enables students to spend their third year at a selected university in Europe (including Denmark, France, Germany, Spain, Sweden and Italy), the USA, Hong Kong, Japan or Australia.

This degree is part of the Integrated Engineering Programme (IEP), a teaching framework that engages students in specialist and interdisciplinary engineering activities designed to create well-rounded graduates with a strong grasp of the fundamentals of their discipline and a broad understanding of the complexity and context of engineering problems.

Students register for a core discipline, but also engage in activities that span departments so the development of fundamental technical knowledge takes place alongside specialist and interdisciplinary research-based projects and professional skills. This creates degrees that encourage professional development, with an emphasis on design and challenging students to apply knowledge to complex problems.

**YEAR ONE**

Core or compulsory module(s)

- Introduction to Biochemical Engineering
- Fluid Flow and Mixing in Bioprocesses
- Thermodynamics
- Biochemistry and Molecular Biology
- Bioprocess Analysis
- Mathematical Modeling and Analysis I
- Design and Professional Practice I
- Integrated Engineering
YEAR TWO

Core or compulsory module(s)

- Downstream Processing for Engineers
- Fermentation and Bioreactor Engineering
- Biochemistry of Protein Production for Biochemical Engineers
- Heat and Mass Transfer in Bioprocesses
- Mathematical Modelling and Analysis II
- Design and Professional Skills II

Optional modules

- You will be able to select one subject from the Integrated Engineering Programme list of Minor subjects.

YEAR THREE

Core or compulsory module(s)

- Bioprocess Plant Design
- Biochemical Reaction Engineering
- Computer Aided Bioprocess Engineering
- Molecular Biology for Bioprocess Engineers
- Chemistry and Industrial Biotechnology

Optional modules

- You will continue with two modules in your selected Minor subject from year two.

FINAL YEAR

Core or compulsory module(s)

- Route: Biochemical Engineering:
  - Bioprocess Systems Engineering
  - Industrial Synthetic Biology
  - Bioprocess Validation and Quality Control
  - Sustainable Industrial Processes and Biorefineries
  - Bioprocess Research Project
  - Route: Chemical Engineering:
    - Advanced Safety and Loss Prevention
    - Process Dynamics and Control
    - Energy Systems and Sustainability
    - Fluid-particle Systems
    - Research Project
  - Route: Bioprocess Management:
    - Advanced Bioprocess Business Plan
    - Bioprocess Research Project
    - Bioprocess Systems Engineering
    - Bioprocess Validation and Quality Control
    - Business in a Competitive Environment
    - Cell Therapy Biology, Bioprocessing and Clinical Translation
    - Project Management
    - Year in Industry: students undertake research on an industrial placement.
    - Study Abroad: students will undertake a research project at an approved university in the EU, North America, South-East Asia or Australia.

Optional modules

- Students on the Biochemical Engineering, Bioprocess Management and Chemical Engineering routes will select credits from a range of optional modules. For more detailed information please see the MEng Prospective Students page. Students on the Year in Industry route will select four modules from the Modular Training for the Bioprocess Industries programme (MBI) to study at UCL.

Your career

The core science, engineering, business and leadership skills that you acquire will provide you with excellent and diverse career prospects. In addition to your core subject knowledge, the programme will provide you with skills such as innovative thinking, team-working and computing.

The excitement of taking biological advances towards new medicines and greener sustainable processes is creating an ever-growing need for biochemical engineering graduates in the biotechnology, pharmaceutical, biofuels, chemical, environment and food industries.

First destinations of recent Biochemical Engineering MEng graduates (2014-2015) at UCL include:

- Supply Chain Graduate, RB (Reckitt Benckiser)
- Associate, PwC
- Biotechnologist, Lonza
- Full-time student, EngD in Biochemical Engineering and Bioprocess Leadership at UCL
- Bioprocess Consultant Engineer, Biopharm Services

Your application

Application for admission should be made through UCAS (the Universities and Colleges Admissions Service). Applicants currently at school or college will be provided with advice on the process; however, applicants who have left school or who are based outside the United Kingdom may obtain information directly from UCAS.

In addition to academic requirements, we will use your application to assess your motivation for studying biochemical engineering. We will be seeking applicants committed to studying at the highest level, who are both eager and able to rise to the challenges presented both by the programme and by a career in the discipline.

If we have made you an offer, you will be invited to an offer-holder's open day. This provides an excellent opportunity for you to visit the departmental facilities and meet current students and staff before making a final decision.

Your learning

You will be taught through a combination of lectures, case studies, team-based projects and laboratory and pilot-plant based practicals. Leading industrialists and researchers regularly visit the department to give guest lectures. Our programmes offer regular opportunities for students to put their learning into practice through the use of scenarios. Case studies and the Design Project are conducted in small teams, with your tutors offering individual support.

Assessment

Written examinations, individual reports, coursework, lab work and oral presentations all contribute towards your assessment.
Entry requirements

A LEVELS
Standard Offer: AAA. Mathematics required, plus one from Biology, Chemistry or Physics.

Contextual Offer: ABB. Mathematics required at grade A, plus one from Biology, Chemistry or Physics.

GCSE
English Language and Mathematics at grade C or 5. For UK-based students, a grade C or 5 or equivalent in a foreign language (other than Ancient Greek, Biblical Hebrew or Latin) is required. UCL provides opportunities to meet the foreign language requirement following enrolment, further details at: www.ucl.ac.uk/ug-reqs

IB DIPLOMA
Standard Offer: 38. A total of 18 points in three higher level subjects including Mathematics at grade 6, plus one from Biology, Chemistry or Physics, with no score below 5.

Contextual Offer: 34. A total of 16 points in three higher level subjects including Mathematics at grade 6, plus one from Biology, Chemistry or Physics, with no score below 5.

CONTEXTUAL OFFERS – ACCESS UCL SCHEME
As part of our commitment to increasing participation from underrepresented groups, students may be eligible for a contextual offer as part of the Access UCL scheme. For more information see www.ucl.ac.uk/prospectus

OTHER QUALIFICATIONS
UCL considers a wide range of UK and international qualifications for entry into its undergraduate programmes. Full details are given at: www.ucl.ac.uk/otherquals

UNDERGRADUATE PREPARATORY CERTIFICATES (International foundation courses)
UCL Undergraduate Preparatory Certificates (UPCs) are intensive one-year foundation courses for international students of high academic potential who are aiming to gain access to undergraduate degree programmes at UCL and other top UK universities.

Typical UPC students will be high achievers in a 12-year school system which does not meet the standard required for direct entry to UCL.

For more information see: www.ucl.ac.uk/upc.

TUITION FEES
The fees indicated are for undergraduate entry in the 2018/19 academic year. The UK/EU fees shown are for the first year of the programme at UCL only. Fees for future years may be subject to an inflationary increase. The Overseas fees shown are the fees that will be charged to 2018/19 entrants for each year of study on the programme, unless otherwise indicated below.

// UK & EU: £9,250 (2018/19)
// Overseas: £25,960 (2018/19)

Overseas fees for the 2019/20 academic year are expected to be available in July 2018. Undergraduate UK/EU fees are capped by the UK Government and are expected to be available in October 2018. Full details of UCL’s tuition fees, tuition fee policy and potential increases to fees can be found on the UCL Students website.

Additional costs
If you are concerned by potential additional costs for books, equipment, etc. on this programme, please get in touch with the relevant departmental contact (details given on this page).

FUNDING
Several major international companies have established a trust fund with the department. This fund provides five bursaries, each worth at least £1,500, which are open to all applicants.

Various funding options are available, including student loans, scholarships and bursaries. UK students whose household income falls below a certain level may also be eligible for a non-repayable bursary or for certain scholarships. Please see the Fees and funding pages for more details.

CONTACT
Dr Brenda Parker

Email: biochemeng@ucl.ac.uk

Telephone: +44 (0)20 7679 9789

Department: Biochemical Engineering

EU referendum
For up-to-date information relating to specific key questions following the UK’s decision to leave the EU, please refer to: www.ucl.ac.uk/ucl-and-europe

Disclaimer
This information is for guidance only. It should not be construed as advice nor relied upon and does not form part of any contract. For more information on UCL’s degree programmes please see the UCL Undergraduate Prospectus at www.ucl.ac.uk/prospectus