BIOCHEMICAL ENGINEERING
MSc / 2018/19 ENTRY
www.ucl.ac.uk/graduate/biochemeng
Have you ever wondered how the latest life science discoveries - such as a novel stem cell therapy - can move from the lab into commercial scale production? Would you like to know whether it is possible to produce bio-polymers (plastics) and biofuels from municipal or agricultural waste? If you are thinking of a career in the pharma or biotech industries, the Biochemical Engineering MSc could be the right programme for you.

Degree summary

Our MSc programme focuses on the core biochemical engineering principles that enable the translation of advances in the life sciences into real processes or products. Students will develop advanced engineering skills (such as bioprocess design, bioreactor engineering, downstream processing), state-of-the-art life science techniques (such as molecular biology, vaccine development, microfluidics) and essential business and regulatory knowledge (such as management, quality control, commercialisation). Three distinct pathways are offered tailored to graduate scientists, engineers, or biochemical engineers.

UCL was a founding laboratory of the discipline of biochemical engineering, established the first UK department and is the largest international centre for bioprocess teaching and research. Our internationally recognised MSc programme maintains close links with the research activities of the Advanced Centre for Biochemical Engineering which ensures that lecture and case study examples are built around the latest biological discoveries and bioprocessing technologies.

UCL Biochemical Engineering co-ordinates bioprocess research and training collaborations with more than a dozen UCL departments, a similar number of national and international university partners and over 40 international companies. MSc students directly benefit from our close ties with industry through their participation in the Department’s MBI® Training Programme.

The MBI® Training Programme is the largest leading international provider of innovative UCL-accredited short courses in bioprocessing designed primarily for industrialists. Courses are designed and delivered in collaboration with 70 industrial experts to support continued professional and technical development within the industry. Our MSc students have the unique opportunity to sit alongside industrial delegates, to gain deeper insights into the industrial application of taught material and to build a network of contacts to support their future careers.

The programme is delivered through a combination of lectures, tutorials, and individual and group activities. Guest lectures delivered by industrialists provide a professional and social context. Assessment is through unseen written examinations, coursework, individual and group project reports, individual and group oral presentations, and the research or design project.

Accreditation

Our MSc is accredited by the Institute of Chemical Engineers (IChemE).

The “Science” and “Biochemical Engineering” streams are accredited by the IChemE as meeting the further learning requirements, in full, for registration as a Chartered Engineer (CEng, MIChemE).

The “Engineering” stream is accredited by the IChemE as meeting the learning requirements, in full, for registration as an Incorporated Chemical Engineer (AMICheM E).

Degree structure

Mode: Full-time: 1 year
Location: London, Bloomsbury

Students undertake modules to the value of 180 credits. The programme offers three distinct pathways tailored to: graduate scientists (“Science Stream”); graduate engineers from other disciplines (“Engineering Stream”); or graduate biochemical engineers (“Biochemical Engineering Stream”). The programme for all three streams consists of a combination of core and optional taught modules (120 credits) and a research or design project (60 credits).

<table>
<thead>
<tr>
<th>CORE MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students are allocated to one of the three available streams based on their academic background (life science/science, other engineering disciplines, biochemical engineering). The programme for each stream is tailored to the background of students in that stream. Core modules may include the following (depending on stream allocation).</td>
</tr>
<tr>
<td>Advanced Bioreactor Engineering</td>
</tr>
<tr>
<td>Dissertation on Bioprocess Research</td>
</tr>
<tr>
<td>Fundamental Biosciences</td>
</tr>
<tr>
<td>Integrated Downstream Processing</td>
</tr>
<tr>
<td>Sustainable Industrial Bioprocesses and Biorefineries</td>
</tr>
<tr>
<td>Please go to the &quot;Degree Structure&quot; tab on the departmental website for a full list of core modules.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPTIONAL MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional modules may include the following (details will vary depending on stream allocation).</td>
</tr>
<tr>
<td>Bioprocess Management - Discovery to Manufacture</td>
</tr>
<tr>
<td>Bioprocess Microfluidics</td>
</tr>
<tr>
<td>Bioprocess Systems Engineering</td>
</tr>
<tr>
<td>Bioprocess Validation and Quality Control</td>
</tr>
<tr>
<td>Commercialisation and Bioprocess Research</td>
</tr>
<tr>
<td>Vaccine Bioprocess Development</td>
</tr>
<tr>
<td>Please go to the &quot;Degree Structure&quot; tab on the departmental website for a full list of optional modules.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESEARCH PROJECT/DESIGN PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students allocated to the “Engineering” stream will have to complete a bioprocess design project as part of their MSc dissertation. Students allocated to the “Science” and “Biochemical Engineering” streams will have to complete a research project as part of their MSc dissertation.</td>
</tr>
</tbody>
</table>

Please go to the “Degree Structure” tab on the departmental website for a full list of core modules.
Your career

The rapid advancements in biology and the life sciences create a need for highly trained, multidisciplinary graduates possessing technical skills and fundamental understanding of both the biological and engineering aspects relevant to modern industrial bioprocesses. Consequently, UCL biochemical engineers are in high demand, due to their breadth of expertise, numerical ability and problem-solving skills. The first destinations of those who graduate from the Master’s programme in biochemical engineering reflect the highly relevant nature of the training delivered.

Approximately three-quarters of our graduates elect either to take up employment in the relevant biotechnology industries or study for a PhD or an EngD, while the remainder follow careers in the management, financial or engineering design sectors.

Recent career destinations* include:
- Biopharmaceutical Processing Engineer, Johnson & Johnson
- Process Engineer, ExxonMobil
- PhD Biochemical Engineering, UCL
- Bio-Pharmaceutical Engineer, GSK (GlaxoSmithKline)
- Research Analyst, CIRS (Centre for Innovation in Regulatory Science)

Employability

The department places great emphasis on its ability to assist its graduates in taking up exciting careers in the sector. UCL alumni, together with the department’s links with industrial groups, provide an excellent source of leads for graduates. Over 1,000 students have graduated from UCL with graduate qualifications in biochemical engineering at Master’s or doctoral levels. Many have gone on to distinguished and senior positions in the international bioindustry. Others have followed independent academic careers in universities around the world.

* Careers data is taken from the ‘Destinations of Leavers from Higher Education’ survey undertaken by HESA looking at the destinations of UK and EU students in the 2013-2015 graduating cohorts six months after graduation.
Entry requirements

Normal entry requirements are at least a second-class Bachelor's degree from a UK university or the equivalent from an approved overseas institution. Candidates offering recent industrial experience are also encouraged to apply. As with any engineering discipline numeracy skills are important for the quantitative description of biological and physical phenomena. Evidence of numerical ability is requested as either an A level in Mathematics (or in exceptional cases, in Physics) or some mathematics studied at university. The department provides mathematics tutoring for Master's students throughout the year adjusted to a candidate's ability.

English language proficiency level

If your education has not been conducted in the English language, you will be expected to demonstrate evidence of an adequate level of English proficiency.

The level of English language proficiency for this programme is: Standard.

Information about the evidence required, acceptable qualifications and test providers is provided at: www.ucl.ac.uk/graduate/english-requirements

Your application

Students are advised to apply as early as possible due to competition for places. Those applying for scholarship funding (particularly overseas applicants) should take note of application deadlines.

When we assess your application we would like to learn:

- why you want to study Biochemical Engineering at graduate level
- why you want to study Biochemical Engineering at UCL
- what particularly attracts you to this programme
- how your academic, professional and personal background meets the demands of a challenging programme. We are particularly interested in any individual or group research project that you have undertaken.
- how will the MSc help you in your future career aspirations

Together with essential academic requirements, the personal statement is your opportunity to illustrate whether your reasons for applying to this programme match what the programme will deliver.

Application fee: There is an application processing fee for this programme of £75 for online applications and £100 for paper applications. More details about the application fee can be found at www.ucl.ac.uk/prospective-students/graduate/taught/application.

FEES AND FUNDING 2018/19 ENTRY

- UK: £12,380 (FT)
- EU: £12,380 (FT)
- Overseas: £25,880 (FT)

The tuition fees shown are for the year indicated above. Fees for subsequent years may increase or otherwise vary. Further information on fee status, fee increases and the fee schedule can be viewed on the UCL Current Students website.

Full details of funding opportunities can be found on the UCL Scholarships website: www.ucl.ac.uk/scholarships

APPLICATION DEADLINE

All applicants: 27 July 2018

Details on how to apply are available on the website at: www.ucl.ac.uk/graduate/apply

CONTACT

Dr Alex Kiparissides, Admissions Tutor

Email: alex.kiparissides@ucl.ac.uk

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/eu-referendum