

## UK: Biotech Training With A Cutting Edge

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The United Kingdom ranks high among students as an attractive destination for higher studies. The UK has a long history of quality education and the intellectual stimulating environment at its colleges makes it the preferred choice for many. A lot of Indian students study in the UK. An indication of this is the MSc Biotechnology and Bioinformatics course offered by the Abertay Dundee University. Last year, out of the 65 students in the course, about 58 were from India!

### Course Structure

#### Undergraduate level

The undergraduate courses in biotechnology and related subjects in the UK are a recent trend. Many of these courses started about six years ago and were developed as a comprehensive module suiting the requirements of the industry. The course duration is three or four years and the academic session starts from October. The first year is generally an introduction to a whole range of subjects. While during the second and third years, the students combine various subjects based on what interest they have to make up the final degree. The program is structured in such a way that it allows the student to delay the ultimate choice of specialization until the second year and to switch between areas of biological, medical or biotechnological science if the interests change. The universities offer a high degree of flexibility and the study programs are modular with a wide range of options in the latter stages of the degree. These choices build on the core knowledge and skills developed through year one and two.

There are undergraduate honors degree programs in biological sciences, biochemistry, human biology, bioinformatics, biotechnology and other related disciplines. The general aim of the undergraduate course is to equip the graduates to pursue

higher degrees focused on research or more vocational courses like an MSc. Typically most of the universities provide an option of choosing from a three-year BSc honors course or a four year BSc honors course. The four-year course is also known as a "sandwich" course, with a year of study overseas or industry experience. Generally the university has tie-ups/links with some institutions abroad. For instance, the University of Birmingham has tie-ups with France, Germany and Spain. Most often after the first and second year of study in the university, the third year is spent abroad in a foreign university or in the industry and for the final year of studies, the student returns to the parent university. The experience of working in the industry as a professional during the course of the degree also helps in defining the career objectives. Most of the universities have extensive links with companies and organizations in diverse fields from the pharmaceutical industry to medical research. For example, the University of Birmingham has tie-ups with companies like GlaxoSmithKline, AstraZeneca, Celltech, Cambridge Antibody Technology, Novartis among others for the one year professional placement of students.

### **Postgraduate level**

The MSc courses are focused specialized educational programs leading to a degree in biotech or related specialized areas. Typically at a postgraduate level most of the universities offer a Masters degree, and also diploma and certificated short-course training programs in the same specialization. The Masters degree program generally runs for twelve months. The first eight months are divided into two semesters of course work, followed by a four-month research project. The taught modules within each semester are self-contained and are also available as independent short courses. The diploma and short courses are designed to provide in-service, refresher or introductory training for those already in the industry.

Some universities offer a Research Masters (Mres) course, which looks at the possibility of spending 50 percent of the time undertaking a research project and 50 percent on course work. Such one-year programs provide an innovative mix of the appropriate theoretical background with research experience for those wishing to gain employment in associated research fields.

### **Research Training**

Most of the universities offer research training at MPhil or PhD levels in various areas of research depending on the areas in which they specialize - Molecular Cell Biology, Molecular Microbiology, Molecular Pathobiology, Organismal and Environmental Biology, Plant Genetics and Cell Biology, Structural Biology and many others. Generally the universities offer an option to students who have performed well in their MSc degree research project to continue their research for a PhD and so complete the MSc and PhD training in three years. The MPhil degrees are two-year courses either run independently or in association with other universities.

## **Gaining Entry**

### **UG level**

Most UK institutions accept the Indian school leaving qualifications (especially from the two main national boards: The Central Board of Secondary Education and the Council for the Indian School Certificate Examinations) for admission to undergraduate courses. The state boards are considered on a case-to-case basis. Applicants have to meet the minimum marks requirements and this varies from institution to institution. Competitive institutions generally expect a much higher percentage of marks.

The institutions also consider other factors such as extra-curricular activities, relevant part-time work experience and the quality of the application. The personal statement and the reference from the principal/teacher are also very crucial!

## "A big percentage of foreign students take up higher studies in UK"

The Universities and Colleges Admission Service (UCAS) co-ordinates applications for undergraduate courses in the UK. Which means that a student only needs to fill up one UCAS application form and can apply for a maximum of six courses. George Abraham, Marketing Director, Warrborough University, Canterbury, Kent, UK shares his views about biotechnology education in UK from the perspective of international students. The student needs to send the completed form to UCAS, which will forward it to the institutions concerned. There is an option of applying online through 'International Apply' too. The deadline for UCAS application to University of Oxford and Cambridge is October 15. All applications received after June 30 are put into clearing.

**What are the different courses in the UK?**  
There is a broad selection of courses at the undergraduate level with many options depending on the strength of the universities and other departments that can support developing new programs. The courses get more specialized at the postgraduate and PhD levels. Typically biotechnology being offered as a subject area is only about 3-5 years old at the first-degree level, but it has been available at both postgraduate and PhD levels much longer, though it was not 'branded' as biotech!

**PG level**  
Most institutions normally require an equivalent to a British first degree in a relevant subject for entry to a postgraduate diploma or Masters degree. The personal statement and references with the application form are very important in the admission process.

**How are the courses structured in the UK?**  
Normally at the first degree level courses are for 3 years and in some cases 4 years. In the latter scenario the student have a chance to either transfer to work within industry or study at another foreign university for a year typically for research courses. Institutions will look for an outstanding academic record. The student will have to submit a research proposal and have a good masters degree. The study transfer is done in the second year whereas the work experience is carried out in the third year of study. Transfer credits for courses are accepted to the 'mother' campus of the student. This is usually only available with the big universities in the UK and possibly with a few 'younger' universities.

There is no centralized system of applications for postgraduate courses in the UK. Each institution has its own application form, which would be available from the institution or their website. There are no deadlines for most postgraduate courses in the UK. However, a few institutions may have application deadlines. So it is best to confirm this from their website or prospectus.

**What are the different scholarships/fellowships available?**  
This will vary according to courses, universities and demand and this can vary from year to year. Foreign students however can apply for them, if applicable, at the time of submission of their application. This must be done early. Other possibilities are scholarships from British Council, Commonwealth focused scholarships for countries and there may be some for India Studies in the UK could be expensive and it would benefit students to go for scholarships and grants. The British government and company funded assistantships. At the Masters and PhD level most students get some sort of financial support through teaching and other research grants. This is the greatest opportunity for foreign students to get scholarships, especially Indians, as the biggest percentages of students taking up higher level studies are non UK candidates. The applications for grants should be made at least one year before the course applied for commences. A majority of the grant-making bodies give a partial grant, which is usually not enough to cover the full cost of a course. The scholarships available for Indian students are as follows:

**How can one enroll for courses in the UK?**

For undergraduate level (first degree) admissions are processed through UCAS, which is a central admission system operated in the UK for all universities and colleges. For postgraduate and PhD level it is done directly with the university concerned. The Chevening (India) Program offers up to 120 annual awards for Indian nationals. The grants are given for one-year masters and short-term professional programs. A university degree or equivalent qualification is a must, along with relevant work experience in case of professional programs. For details, visit [www.britishcouncil.org.in/scholarships](http://www.britishcouncil.org.in/scholarships).

**Please elaborate on courses offered by your institute.**

We at Warrborough only offer biotech related programs at the PhD levels. The focus is slightly different than the traditional PhDs. We do not have extensive laboratories focused approach that is the fundamental research type PhD. Most of the students doing a PhD at the institute will be doing comparative research in the broad 'arena' called biotech. For example we had a student who completed a PhD in Neuro-pharmacology with us and is now an Assistant Professor at the University of Kansas Medical Center, USA focusing on Parkinson's disease and Occupational Therapy. Another way of PhD research studies at Warrborough is the Advanced Research Centre for Comparative Bioethics (ARCCB). This Centre focuses on research related to the fast developing issues around new found cures, medical procedures, 'green' economics,

**The Commonwealth Scholarship/Fellowships Plan**  
This scheme assists academically able students from developing Commonwealth countries who would benefit from higher education in Britain to the developmental advantage of their home countries, but for financial reasons are unable to study in the UK and are outside the scope of other British government support schemes.

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Awards are for postgraduate courses. For details, visit [www.acu.ac.uk](http://www.acu.ac.uk)

## Overseas Research Students Awards Scheme (ORSAS)

These grants are for postgraduate students undertaking full-time study for a higher degree as registered research students at British universities. Selection of candidates is based solely on academic merit and research potential. The scheme supports approximately 800-850 new awards each year in the UK. For further details, visit [www.universitiesuk.ac.uk/ors/](http://www.universitiesuk.ac.uk/ors/).

## Royal Society Fellowships

The Royal Society runs a scheme of research appointments within the UK and a series of programmes encouraging exchanges of information, dialogue and visits overseas. These fellowships enable key post-doctoral scientists from a selection of countries to undertake research in the UK.

Some other scholarships available are Inlaks ([www.inlaksfoundation.org](http://www.inlaksfoundation.org)), Rhodes ([www.rhodesscholarship-india.com](http://www.rhodesscholarship-india.com)), Scottish Executive ([www.scotlandscholarship.com](http://www.scotlandscholarship.com)). Some of the universities also offer scholarships for international students.

### **Tie-ups between Indian and UK Institutes**

The increased interest between the two countries has led to some academic partnerships between universities of the two countries. The University of Central Lancashire currently has a partnership with DY Patil Mahavidyapeeth, Nerul, Navi Mumbai. Students do part of the BSc (Hons) Biomedical degree program in India and the balance in the UK at the University of Central Lancashire. The first batch had 14 students and the second batch had approximately 40 students. Further details can be obtained from D Y Patil Vidyapeeth, Vidyanagar, Nerul, Navi Mumbai.

The University of Abertay, Dundee is also exploring partnershipsX biotechnology with a few institutions in India.

Thus, the UK provides a wide range of flexible opportunities for higher studies beckoning the Indian student fraternity.

*Rolly Dureha*