

# THE INTERDEPARTMENTAL HONOURS PROGRAMME IN **BIOTECHNOLOGY**

## Programme Information

Biotechnology Honours is a unique inter-departmental programme aimed at enabling students to pursue their interest in biotechnology through any of the relevant research areas within the molecular biosciences, including genetics, biochemistry, plant pathogens, molecular virology and microbiology. The Biotechnology study programme at the University of Pretoria has a strong emphasis on gene technologies and interested students are expected to have a solid background in biochemistry, genetics and molecular microbiology in addition to any other modules of their choice.

While the Department of Genetics is responsible for coordinating both the study programme and the involvement of the participating Departments, the students within this programme will register and will conduct their studies within the Department of their choice. A student's choice of research programme will determine which of the participating Departments will "become home" to their honours degree. Participating departments include the Dept of Biochemistry, the Dept of Genetics, the Dept of Microbiology, and the Dept of Plant and Soil Sciences.

### OBJECTIVES OF THE PROGRAMME

The Biotechnology Honours programme is designed to provide students with career-orientated training in molecular biotechnology. The most important study objective is to teach students to read, think and communicate in their chosen study field of study. The following specific objectives can be identified:

- ✓ To obtain an overview of Biotechnology, its various applications and possibilities.
- ✓ To learn how to collect information from the literature and how to process and integrate that information.
- ✓ To learn how to communicate scientifically about their research.
- ✓ To master the technical aspects necessary for working in the field of molecular biotechnology.
- ✓ To learn how research is planned, conducted, evaluated and reported.
- ✓ To obtain insight into the entrepreneurial side of Biotechnology.

### GENERAL INFORMATION

#### REQUIREMENTS FOR ADMISSION:

All applicants must have a Bachelor of Science degree in the biological sciences (NQF level 7) with clear evidence of a strong background in Genetics and Biochemistry. We require at least a 60% average across all final year modules (lower second) for the preceding degree. In-house students who wish to continue with an Honours degree in Biotechnology must have completed the modules BCM 356, GTS 351 and MBY 364 as part of their undergraduate programme. In addition, applicants must have successfully completed at least 3 final year modules in the Department with whom they choose to do their honours research project. Additional modules may be prescribed on an *ad hoc* basis to remedy deficiencies in a candidate's undergraduate training.

PLEASE NOTE: The study programme is presented in English and we require all students to be fully proficient in this language.

All applications for admission are screened on an individual basis by the participating Departments. Only a limited number of students are annually admitted to the Hons programme and preference is given to students who achieved excellent academic results at undergraduate level.

#### THE SELECTION PROCESS:

##### ■ In-house students:

Please apply for postgraduate study at NAS Student Administration in the foyer of the Agricultural Sciences

building or online through your Student Portal (MyTuks login). Also submit a full, up-to-date printout of your academic record to Ms Lucille Hermann (Agric Sciences bldg, rm 8.39-1). Note that applications will not be processed based on 1<sup>st</sup> and 2<sup>nd</sup> year marks only. Please ensure that your correct contact details (email and cell nr) are available on your Student Portal. Please take note of the attached closing dates for applications.

Applicants are encouraged indicate on the internal application form (available from Ms Lucille Hermann) in which of the participating departments they wish to do their Hons programme. However, if no preference is indicated, applications will be placed according how final year modules were combined.

#### ■ Students from institutions other than UP:

Interested persons may apply by completing the online UP application form at <http://www.up.ac.za/new-students-undergraduate/article/256308/doen-aansoek-by-universiteit-van-pretoria>. Please ensure that you provide the correct contact details and address. It is essential that a CV and up-to-date academic record is attached as supporting documentation (see "step 10" of the online UP application process). If you do not have your final marks as yet, please include your official progress marks and ensure that we receive your final marks as soon as possible! Note that applications will not be processed based on 1<sup>st</sup> and 2<sup>nd</sup> year marks only. Please take note of the attached closing dates for applications. International applications must be submitted by the end of August and will be processed as soon as possible thereafter.

- Applicants are encouraged indicate on the accompanying documents in which of the participating departments they wish to do their Hons programme. Applications will be forwarded to the respective Departments, as indicated. However, if no preference is indicated, applications will be placed according to the research field in which their final year modules assort.
- The respective Departments will screen applicants in accordance to their own criteria and admission quotas. Additional criteria and admission requirements may be imposed by the respective Departments and such information will be available from the corresponding contact persons listed below.
- Successful candidates will be notified via email and/or will receive official letters of acceptance in early December.

#### **BURSARIES:**

There are NRF bursaries available for students who have excelled in their academic career. Please consult the University's bursaries office for more information or apply online at <http://www.nrf.ac.za/bursaries/calls>. University Fees Waiver bursaries are also available and all registered students will automatically be considered. However, it is dependent on the availability of funds; bursaries are not guaranteed and equity considerations apply.

#### **GENERAL:**

This is a full-time programme that usually lasts for one full year. Students are generally expected to be in the Department on a full-time basis during the academic year and to participate fully in all departmental activities. Students are provided with space in their Department in which to work.

#### **COMPOSITION OF THE PROGRAMME**

The Honours programme serves as the first level of postgraduate training and therefore aims to provide the student with fairly broad-based training, even though students choose in which research specialization they would like to do their research projects. While there are some common compulsory aspects to all Biotechnology Honours programmes, each of the Departments involved in the Biotechnology programme will structure their programme to suit *their* specific needs. Specific details regarding any of the programmes can be obtained from the respective Departments (see contact info below). Common compulsory aspects to all Biotechnology Honours programmes include:

#### **TECHNIQUES COURSE COMPONENT:**

All candidates must successfully complete a comprehensive molecular/recombinant DNA techniques course that will provide exposure to a wide range of the recombinant DNA technologies in molecular biotechnology.

#### **RESEARCH PROJECT:**

Students are required to complete a limited research project within one of the Departments in the Biological Sciences. All projects will have a strong focus on molecular biotechnology and the above technical training

serves as a foundation for the research project. The project aims to teach students the basic concepts of research planning and how to develop strategies and use technology to answer specific questions. Wherever possible, the project is conducted under the direct leadership of a lecturer or senior student and the Honours student usually forms part of a team.

**LITERATURE SEMINAR COURSE:**

Candidates will participate in the seminar courses presented in their respective Departments. They have to present at least one seminar with a strong biotechnology focus. All students registered for BSc(Hons)(Biotechnology) will have to attend all the seminars of the Biotechnology Honours students irrespective of the Departments in which they are presented.

**ADVANCED TOPICS IN THEIR DISCIPLINE OF CHOICE:**

This could involve e.g. selected course work or topical essays. The exact content is left to the discretion of the respective Departments.

**MLB 721: Molecular and Cellular Biology**

This module addresses the principles and applications of molecular biotechnology. Strong emphasis is placed on the principles of research planning and the use of molecular technology to address such questions in biotechnology. The module is assessed by means of a research project proposal conceived and formulated by each student. This proposal should focus on the use of recombinant DNA technology in addressing questions in the biotechnological field. Students must choose their own research topic and are encouraged to find something that is directly related to their own field of interest, postgraduate specialization or future career commitments. There is also an oral examination during which students are required to defend their research proposal.

**BTW 701: Biotechnology in the Workplace 701**

This module focuses on the realities of working in the field of Biotechnology. It includes aspects such as entrepreneurship development, economic implications and financing, intellectual property and patents, bioethics, biotechnology and public understanding thereof. Knowledge and insights gained from this course will be assessed by means of a simulated grant application for the development of a hypothetical biotechnological venture.

Please feel free to contact any of the persons below for more information on the Biotechnology Honours programme in the contributing departments:

**Dept of Genetics**

- Ms Lucille Hermann +27 (0)12 420 3254 LUCILLE.HERMANN @up.ac.za

**Dept of Plant and Soil Sciences**

- Dr Bridget Crampton +27 (0)12 420 6673 BRIDGET.CRAMPION @up.ac.za
- Prof Dave Berger +27 (0)12 420 4634 DAVE.BERGER @up.ac.za
- Dr Juan Vorster +27 (0)12 420 4491 JUAN.VORSTER @fabi.up.ac.za
- Dr Eugene Makgopa +27 (0)12 420 4676 EUGENE.MAKGOPA @up.ac.za

**Dept of Biochemistry**

- Dr Jandeli Niemand +27 (0)12 420 2479 JANDELI.NIEMAND @up.ac.za

**Dept of Microbiology**

- Prof Jacques Theron +27 (0)12 420 2994 JACQUES.THERON @up.ac.za
- Dr Emma Steenkamp +27 (0)12 420 3262 EMMA.STEENKAMP @up.ac.za