# University of Pretoria
# Department of Genetics

## HONOURS in GENETICS
## HONOURS in BIOTECHNOLOGY

**OBJECTIVES OF THE PROGRAMME**

The Honours programme is designed to provide graduates with comprehensive, career-oriented training, which should enable them to work as geneticists in a variety of applied research fields. The most important study objective of our Honours programme is to enable students to read, think, strategize and communicate in their chosen field of study. The following specific objectives can be identified:

- To cultivate an integrated perspective of Genetics, with its diverse sub-disciplines and range of applications, and to develop conceptual thinking skills;
- To collate and critically evaluate literature, as well as to effectively assimilate the relevant information;
- To communicate effectively in a scientific context about genetics and genetic research, as well as science in general;
- To understand how hypothesis-driven research is conceptualized, planned, conducted, assessed and reported.
- To master the technical aspects necessary to work in the field of genetics as a researcher;
- To cultivate an ethic of teamwork, while also encouraging independent thinking within a research environment.

The Department of Genetics currently presents two Honours degree programmes:

- A **BScHons (Genetics)** following completion of a recognized research-oriented BSc study programme with Genetics as a major. The Honours programme is a one-year, fulltime degree presented at NQF level 8.
- A **BScHons (Biotechnology)** following completion of a recognized research-oriented BSc study programme with a thorough background in molecular biotechnology, including Genetics, Microbiology and Biochemistry modules. The programme is a one-year, fulltime degree presented at NQF level 8. (Also see separate information brochure.)

**GENERAL INFORMATION**

Our BSc(Honours) is a full-time programme that commences in January and concludes early December. Honours students are expected to be in the Department on a full-time basis during the year and students are provided with office and laboratory space in which to work. Only in very exceptional cases, and in strict consultation with the Head of Department, might it be possible to complete selected components of the programme, such as the research project, on a part-time basis.

**Hons programme coordinators and mentors:**

- Prof Paulette Bloomer
- Dr Kershney Naidoo
- Ms Lucille Hermann

**Requirements for Admission:**

All applicants must have a research-oriented Bachelor of Science degree in the biological sciences (NQF level 7) with clear evidence of a strong scientific background in Genetics. We require *at least* a 60% average across all final year Genetics modules, as well as a 60% GPA (lower second) across all final year modules for the preceding degree. Resident students who wish to continue with an Honours degree must have completed at least 72 credits of Genetics modules at 300-level, one of which must be Eukaryotic Gene Control & Development (GTS 351).

Exposure to a biometry or mathematical statistics module at undergraduate level is essential. Where deemed necessary, the Department reserves the right to prescribe one or more undergraduate modules in order to redress identified 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.

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

Students with an appropriate four year BSc(Agric) degree, who comply with the admission requirements, may register for a Masters degree. However, applicants will still be required to complete selected components from the Honours programme as part of the requirements for their MSc degree. Students with a BTech degree must contact the Department regarding admission requirements.

**Application Process:**

◢ **In-house students:**

Please apply for postgraduate study online through your **Student Portal** (MyTuks login) or at NAS Student Administration in the foyer of the Agricultural Sciences building. Also submit a **full, up-to-date academic record** to Ms Lucille Hermann (Agric Sciences bldg, rm 8.39-1). Note that applications *will not* be processed based on 1st and 2nd year marks only. Please ensure that your correct contact details (email and cell nr) are updated on your Student Portal. Please take note of the attached closing dates for applications.

◢ **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 1st and 2nd 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.

**Admission Process:**

There are only a limited number of Honours positions available each year and is strictly dependent on the supervisory capacity in the Department. The admissions panel will consist of all the lecturing personnel in the Department and attention will be given to the applicant's undergraduate background, their academic achievement and English language proficiency. There will be two rounds of selections - the first will take place at the end of July and the second in November. Successful (and short listed?) candidates will be notified via email.

Applicants who were admitted during the first cycle of selections will receive provisional admission, pending their final examination results. Provisionally accepted candidates must notify the Department of their intention to accept or decline their Hons position no later than 6 November. Note that admission can be revoked if the candidate no longer complies with the minimum admission requirements, as stated above, based on their final examination results or if they failed to notify the Department of their intent to accept the position in time.

Candidates admitted during the second round of selections must either accept or decline their offered positions in the programme before the University closes in December. Unconfirmed positions at that date will be retracted and may be awarded to shortlisted candidates.

Late applications may be considered if and when positions become available prior to the start of the programme and after attention has been given to short listed candidates. The admissions panel reserves the right to invite shortlisted candidates for a selection oral or to write an admission examination to verify basic genetics background and/or level of understanding.

Hons students are expected to complete their registration as soon as possible, but preferably no later than the end of January. Some of the early assignments require access to ClickUP and the UP Library, which can only effected after registration has been completed.

**Bursaries:**

A limited number of UP postgraduate bursaries are potentially available to students with an undergraduate final year weighted average of **at least 65%.** (PLEASE NOTE: The actual cut off percentage will vary depending on the availability of funds; bursaries are **not** guaranteed and equity considerations apply). There are some NRF bursaries available for students who have excelled in their undergraduate studies. Please consult the University's bursaries office for more information or apply online at http://www.nrf.ac.za/bursaries/calls. Please talk to the Department as soon as possible if you encounter serious financial constraints!!

## COMPOSITION OF THE PROGRAMME

The Honours programme serves as the first level of postgraduate training in Genetics and therefore covers the broader field of Genetics. Students are strongly advised to use the Hons programme as an opportunity grow and enhance their skills and knowledge in all aspects of Genetics. The Genetics Honours programme currently consists of:

- **GTK 702: Seminar Course (15 credits)**

During this module students are expected to both present several short "journal club"-type presentations of selected articles, and to write several longer essays. The objective of the module is to teach students how to collect information and condense this into the format of either a short oral presentation or a more detailed oral and written report. A main outcome for this module is that students understand the process through which information is accumulated, evaluated, processed and communicated.

- **GTK 704: Trends in Genetics (15 credits)**

A short series of discussions and essays focusing on a selection of advanced topics, as well as recent advances in the field of genetics, and with an emphasis on contextualising these developments within the broader framework of the Biosciences and its role in modern society. Ethical and philosophical issues in genetics are debated. Students registered in the Biotechnology programme replace this module with BTW 701 – Biotechnology in the Workplace.

- **GTK 705: Research Methods (30 credits)**

Students are guided through the methodology of research planning and data handling. The *joint techniques course* covers all basic recombinant DNA techniques and related technologies such as centrifugation, electrophoresis, gene cloning, hybridization, protein analysis, as well as PCR, sequencing and basic bioinformatics training. This course is followed by a selection of *advanced technique courses*. Scientific writing and presentation skills required for research in genetics are also addressed. The module is assessed by means of reports, presentations, as well as the mid-year exam.

- **GTK 703: Research Project (15 credits)**

An Honours research project has well defined limits and aims to teach students the basic concepts involved in research planning, how to develop appropriate strategies and how to use diverse technologies to answer well defined questions. The module also has a strong theoretical component since emphasis is placed on writing and presenting a comprehensive literature review and project proposal, as well as a workshop on aspects of career-development.

The projects will give students experience in a range of cutting-edge technologies to which they will be exposed in the workplace. Students are first introduced to the various research focus areas in the Department and then allowed to select a project from one of the research areas. The project is usually conducted under the direct mentorship of a senior postgraduate student and the Honours student forms part of the research programme's team. The research project is the main activity during the second half of the year and is assessed in the form of a written report in the format of a research article, a formal presentation and a research poster. In some instances may be possible to extend the Honours project to develop into an MSc project. This might reduce the time necessary to complete the MSc.

- **MLB 721: Molecular and Cellular Biology (15 credits)**

The module addresses the principles and applications of molecular biotechnology. Very strong emphasis is placed on the principles of research planning and the use of molecular technology to address questions in the biological sciences. The module is assessed by means of a research project proposal submitted by each of the students. This proposal should focus on the use of recombinant DNA technology in addressing questions in the biological sciences. Students may choose their own research proposal topic and are encouraged to choose something that is directly related to their own field of interest, postgraduate specialization or future career commitments. There is also an oral examination based on the proposal submitted.

Students are welcome to approach any of the lecturing staff in the Department of Genetics if you have any more questions regarding the Honours programme or if you would like to know more about the research programmes in the Department.

Enquiries can also be directed to: Lucille Hermann (012 420 3254; LUCILLE.HERMANN@up.ac.za)

Last updated: May 2017