



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

DEPARTMENT OF GEOGRAPHY, GEOINFORMATICS AND METEOROLOGY

BScHons Geoinformatics

2019

1. GEOINFORMATICS

Geoinformatics concerns the nature and function of geographic information including its collection, storage, analysis, visualization, interpretation and distribution. Geographic information is information with implicit or explicit reference to a location relative to the Earth. Geoinformatics provides the scientific foundation for geographic information systems (GIS), *i.e.* the software, hardware, data and people for collecting, processing, managing, analysing and visualizing geographic information. The volumes of geographic information and the use of GIS are rapidly on the increase. New applications are being developed daily in a wide range of applications from utilities to environmental management.

The postgraduate programme in Geoinformatics offers a pathway to an interesting career: either as a registered GISc Professional, or the Honours in Geoinformatics could be a complementary qualification to a career in another discipline such as environmental science, geology or geography.

2. ACCREDITATION

The BSc Geoinformatics and BScHons Geoinformatics programmes have been accredited by the South African Geomatics Council (SAGC). Upon successful completion of the BSc Geoinformatics and BScHons Geoinformatics degrees, you can register as a GISc Professional. If you have a different first degree and complete the BScHons Geoinformatics degree at UP, you may have to take additional undergraduate modules to meet registration requirements. Consult the SAGC website at <http://sagc.org.za> for more information.

3. APPLICATION, SELECTION AND ADMISSION REQUIREMENTS

Admission into BScHons Geoinformatics is a BSc in Geoinformatics or equivalent BSc degree that meets the prerequisites of the Honours modules. Prospective students may be required to do additional modules to enable them to reach the desired level of study.

A prospective student must have an average of 60% or more in the major relevant subjects in the final year of the bachelor's degree. Selection takes place before admission and the number of places is limited. The prospective student's academic record is evaluated, and one of four selection outcomes is possible:

1. Accepted to BScHons Geoinformatics.
2. Accepted to BScHons Geoinformatics on the condition that several prescribed modules are completed simultaneously with the Honours programme.
3. Not accepted to BScHons Geoinformatics. Accepted to BSc Natural Sciences Undergraduate Special. The student must successfully complete several prescribed undergraduate modules in a bridging year. **Note that undergraduate lectures and practicals are presented during the day on weekdays on the Hatfield campus.** If the student achieves an average of 60% in these modules, he/she may re-apply for BScHons Geoinformatics in the following year. Note that the bridging modules cannot be completed over more than one year.
4. Not accepted. The applicant does not comply with the admission requirements.

Amongst others, the following additional modules may be prescribed:

INF 154, Informatics	GIS 310, Geographic information systems	GMA 220, Remote sensing
INF 164, Informatics	GIS 320, Spatial analysis	GMA 320, Remote sensing
INF 214, Informatics	GMC 310, Geometrical and space geodesy	

Online application is available on www.up.ac.za, click on 'Study at UP > Apply at UP' in the top menu.

**Applications for BScHons Geoinformatics close on 30 September.
Late applications will be accepted only if places are still available.**

The first meeting for Honours students is usually towards the end of January. The final date will be announced early in January via email by the Honours coordinator. Lectures usually commence a week after the first meeting.

Successful applicants are required to write a compulsory academic literacy test (**on campus**) before the first meeting in January. Depending on the outcome, students may have to enrol for an additional academic literacy module and/or complete the programme over two years.

Part-time students should plan to complete the programme over two years.

4. MODULES AND CREDITS

Depending on the required number of modules this programme can be completed over one or two years. It is advisable for part-time students to do the programme over two years. The timetable is announced at the beginning of the year. Classes are usually scheduled during the week from 16:30 onwards or on Saturdays. In addition, several workshops and/or practical sessions, some on Saturdays, may be scheduled. The timetable varies from year to year, depending on staff availability and student numbers.

Code	Module Name	Credits	Period
Fundamental modules (compulsory):			
GIS 701	Research methods	10	Q1
GIS 703	GIS professional practice	15	S1 or S2
Core modules (compulsory):			
GIS 702	GIS project	35	Y
GIS 704	Spatial statistics and geodesy	15	S1 or S2
GIS 705	Advanced geospatial data	15	S1 or S2
GMA 705	Advanced remote sensing	15	S1 or S2
Elective modules (two modules, of which one must be COS 787 or GIS 706):			
GIS 706	Internet GIS	15	S1 or S2
GIS 707	Special topics	15	TBA
COS 787	Spatial databases	15	S1 or S2

Appropriate Honours modules from the faculty or from the School of Information Technology, approved by the Honours coordinator or Head of Department, may be taken.

Minimum credits: 135

5. MODULE DESCRIPTIONS

5.1. GIS 701, Research methods

The module introduces students to planning, research design, scientific reading, writing and presentation as required for geoinformatics research.

Admission to BScHons Geoinformatics.

5.2. GIS 702, GIS project

An approved individual research project carried out under the guidance of a lecturer. The student is expected to obtain the respective skills necessary for the research topic. Compilation of a research proposal. Literature survey. Selecting an appropriate research method. Carrying out of the research. Preparation of a research report.

Prior knowledge: Admission to BScHons Geoinformatics.

5.3. GIS 703, GIS professional practice

The module introduces the organisational aspects of GIS (how it fits into an organisation, critical success factors and people issues), GIS project management and GIS professional issues (GIS profession, professional registration, business practice, and ethics).

Prior knowledge: Admission to BScHons Geoinformatics.

5.4. GIS 704, Spatial statistics and geodesy

Principles of least squares in statistics, spatial least squares regression, surface interpolation using least squares and coordinate transformations. Topics in Geodesy: Space-based measurement systems, sea level measurements, determination of the geoid, earth axis orientation determination and earth dynamics.

Prior knowledge: GMC 110, Cartography, and GMC310, Geometrical and space geodesy, or equivalent.

5.5. GIS 705, Advanced geospatial data

Advanced topics in geospatial data management, such as data quality assurance, data quality assessment and the supply chain for geospatial data acquisition.

Prior knowledge: Admission to BScHons Geoinformatics.

5.7. GIS 706, Internet GIS

This module aims to explore the Internet as a platform for accessing and delivering geospatial data and services. Students will be exposed to the theory and practice of technologies and technology approaches that make Internet GIS a reality. From the basic building blocks of Internet GIS, to advanced Spatial Data Infrastructure concepts, this module covers current and emerging issues in bringing geospatial data and processes to the wider world. Students will be required to reflect on the implications of using such technologies. A significant portion of the module will involve 'hands-on' work in designing and building Internet GIS applications and accessing Internet-based data and services. This module also includes consideration of a number of case studies within different problem domains. Students should leave the module with an understanding of the building blocks that make Internet GIS possible and be able to consider what are good practices in the development of Internet GIS applications and services.

Prior knowledge: INF 154, Informatics (Introduction to programming) and INF 164, Informatics (Programming), or equivalent.

5.8. GIS 707, Special topics

A special topic in Geoinformatics linked to research specialization in the department and/or visiting lecturers. For example, research trends and advances in a specific topic or field of specialization in Geoinformatics. The module is presented in the form of guided advanced readings, seminars and/or discussion sessions.

Prior knowledge: Admission to BScHons Geoinformatics and any other prerequisites specified by the lecturer.

5.6. GMA 705, Advanced Remote Sensing

The aim of the module is to provide knowledge and understanding of image analysis and information extraction methods in remote sensing. The emphasis is on equipping students with knowledge and skills necessary to process imagery to extract diverse biophysical and geospatial information. The module gives insight into the possibilities and limitations of the application of modern remote sensing/image acquisition systems for Earth and atmosphere research purposes at different levels of detail.

Prior knowledge: GMA 220, Remote sensing (Theory) and GMA 320, Remote sensing (Application), or equivalent.

5.9. COS 787, Spatial databases

This module covers the major themes of spatial databases with application to geographic information systems (GIS), i.e. systems concerning data with an implicit or explicit reference to a location relative to the earth. Topics covered include an introduction to spatial databases and spatial data management systems, representation of geographic data, spatial data modelling, computational geometry, spatial data indexing, query processing and spatial data standards. For Computer Science students the module is an introduction to the ever-increasing application field of geographic information systems (GIS), and for Geoinformatics students the module provides insight into the Computer Science foundations of the field.

Prior knowledge: INF 214, Informatics (Relational databases), or equivalent.

6. FEES, FUNDING AND BURSARIES OPPORTUNITIES

For information about fees and funding (including scholarships and bursaries, visit the UP website, www.up.ac.za, click 'Study at UP > Postgraduate students' in the top menu, then 'Fees and Funding' in the menu on the left.

External bursaries and studentships are also available. For example, by the South African Geomatics Council (www.sagc.org.za, click on 'Studying' then 'Bursaries') and the CSIR (www.csir.co.za, click on 'Careers' in the top menu).

7. INFORMATION FOR INTERNATIONAL STUDENTS

The first step for international students is to have their existing academic qualifications evaluated by the South African Qualifications Authority (www.saqa.org.za). It is essential to attach the SAQA certificate to your online application.

Additional information for international students is available on the UP website, www.up.ac.za, click on 'Study at UP > International Cooperation Division' in the top menu.

8. FREQUENTLY ASKED QUESTIONS

The weighted average for my final year was below 60%, will I still be considered for the BScHons Geoinformatics programme?

The weighted average on a transcript is calculated for all the modules completed in that year. For admission to BScHons Geoinformatics, a prospective student must have an average of 60% or more in the major relevant subjects in the final year of the bachelor's degree.

I am currently completing my final year undergraduate studies, therefore the weighted average for my final year modules is not yet available. Can I still apply for next year?

Yes. Please provide your semester marks when you apply. The selection panel will consider those marks and if applicable, you will be accepted on the condition that your final weighted average is 60% or more.

I completed my B.Tech, will I be considered for the BScHons Geoinformatics programme?

Unfortunately, the admission to any Honours degree in the Faculty of Natural and Agricultural Sciences requires that you hold a BSc degree. You may consider applying for the BScHons Geoinformatics programme to get into the bridging programme. Alternatively, you could apply for the BSc Geoinformatics degree. The BSc Geoinformatics and BScHons Geoinformatics are accredited by the

SAGC and if you complete both, you meet the academic requirements for registration as a GISc Professional with the SAGC.

I completed my BA degree, will I be considered for the BScHons Geoinformatics programme?

Unfortunately, the admission to any Honours degree in the Faculty of Natural and Agricultural Sciences requires that you hold a BSc degree. You may consider applying for the BScHons Geoinformatics programme to get into the bridging programme. Alternatively, you could apply for the BSc Geoinformatics degree. The BSc Geoinformatics and BScHons Geoinformatics are accredited by the SAGC and if you complete both, you meet the academic requirements for registration as a GISc Professional with the SAGC.

I completed a BSc degree in a related field (not Geoinformatics) and received a weighted average of above 60%. Will I be able to start with the BScHons Geoinformatics programme immediately?

Your selection for the programme will depend on the geoinformatics related modules that you completed during your undergraduate degree. The undergraduate modules must meet the admission requirements for the Honours modules listed in Section 5. Remember to attach your full transcripts and yearbook when you apply. The selection panel will then review your transcripts and determine if you meet the admission requirements or if you need to complete additional modules. Refer to Section 3.

How do I know whether the undergraduate modules that I completed meet the admission requirements for the Honours modules?

The prerequisite modules for Honours modules are listed in Section 5. Search for the code of a prerequisite module in the yearbook at <http://www.up.ac.za/yearbooks/home> to find its description. Compare this to the modules that you completed. However, the final decision lies with the selection panel.

9. CONTACT DETAILS

Please e-mail any queries to:

Dr Victoria Rautenbach (coordinator), victoria.rautenbach@up.ac.za

Ms Erika Pretorius (administrative queries), erika.pretorius@up.ac.za

Ms Martha Tshoke (Faculty administrative queries), martha.tshoke@up.ac.za

Website: <https://www.up.ac.za/geography-geoinformatics-and-meteorology>, click on 'Study'.