



Bachelor of Science (Honours) in Geosciences and Statistics and Operations Research

Course overview:

The Course shall consist of two parts, namely, Part One comprising the first three years and Part Two comprising the fourth year.

(1) Part One shall consist of study-units to which 180 credits are assigned and indicated in the programme of study and divided as follows:

First Year: in addition to the compulsory and elective study-units outlined in the programme of studies of the chosen areas (not less than 26 credits in each of the two areas), you are required to register for optional study-units to bring their total for the year to 60 credits,

Second Year: 30 credits in each of the two areas of study,

Third Year: 30 credits in each of the two areas of study.

At the end of Part One, if you obtain 180 credits as specified in paragraph (1) but either opt not to proceed with the Course leading to the Honours Degree, or having proceeded, do not successfully complete the Course, then you shall be eligible for the award of the degree of Bachelor of Science (B.Sc.).

(2) Part Two shall consist of study-units to which 60 credits are assigned divided as follows:

(a) 40 credits in one area of study, of which 18 credits are assigned to a dissertation, and

(b) 20 credits in the other area of study,

provided that in the case of Mathematics, the dissertation may be substituted by one or more additional taught study-units.

Geosciences

The Geosciences are at the core of many of today's global issues, such as natural resources and their exploration/exploitation, climate change, geohazards and environmental problems. The Department of Geosciences aims to develop a new generation of highly skilled geoscientists, who will have a rigorous scientific education in the natural and earth sciences, field and computational proficiency, as well as hands-on experience with modern equipment and facilities. Geoscience graduates have a holistic understanding of how the Earth works and how to solve real-world problems. The Geoscience course is a four-year programme, in which the first two years consist of compulsory study-units, which provide a sound scientific foundation in a number of geoscience areas, while the

last two years contain a wide choice of elective study-units that allow the students to study specialised areas of geosciences.

The necessary physics, mathematics, chemistry and computational requirements are thoroughly covered through purposely designed units, study-units offered by the joint subject area, or by other departments. The first two years introduce core areas in the Geosciences, such as geology, geophysics, fundamental oceanography and atmospheric studies, environmental physics and environmental management principles as well as GIS and Matlab skills, giving the student a multidisciplinary overview of the Earth and its processes. Elective study-units in the third and fourth years include more specialised topics in solid earth, ocean and atmospheric sciences. Thus, the course will provide the opportunity to select an elective "pathway" according to the student's preference, for example in geology and geophysics, atmospheric science or oceanography, without however being too rigid to allow a choice of units from the other streams. The fourth-year independent research project will be compatible with the chosen study-units.

Throughout the course, whenever possible, study-units are designed to include laboratory/field/computational components so as to give you a hands-on experience of modern geoscientific methods and tools, and a sound preparation for an eventual career with geoscience applications. Assessment will be through a mixture of examinations, progress tests, lab and field reports, practical, computational and theoretical assignments such that the students' understanding and application of the taught subject matter can be continuously assessed.

Statistics and Operations Research

The four-year programme of studies for Statistics and Operations Research as part of the B.Sc. (Hons) degree has been designed for you to embark on a four-year plan which helps them learn a number of topics considered to be fundamental in the academic disciplines of Statistics and Operations Research, and to follow fruitfully a set of accompanying study units which are oriented towards specialized areas. Due emphasis is given to the mathematical, computational and modelling aspects of Statistics and Operations Research. Students will also be guided to appreciate the research and cultural potential of Statistics and Operations Research within contemporary society. Study-units have been, and are, being designed to incorporate a blend of:

- pedagogical issues
- an acceptable degree of mathematical and logical rigour
- continuous exposure to the practical dimension of the subjects
- responsiveness to current advances in the relevant subjects
- proficiency with reference to the computational aspect of the subjects.

Learning outcomes:

Geosciences

At the end of the course, you should be able to:

- Demonstrate a comprehensive understanding of the structure, physical properties, processes and interactions within the various spheres making up our planet.
- Use acquired mathematical, physical and computational skills to formulate, model and solve a variety of problems relating to earth science, dynamic systems and the environment.
- Demonstrate familiarity with a number of instrumental techniques and computational software related to geoscientific investigation, and develop adaptability to a number of outdoor situations and tasks.
- Demonstrate a critical understanding of topical environmental and geoscientific issues (such as climate change, geohazards, Earth resources, air and sea pollution, etc) and an ability to evaluate geoscience publications and literature.
- Have a fundamental understanding of geological principles and integrate different data into geological models, using a variety of IT and computational tools.
- Design and implement basic geophysical investigations for environmental, archaeological, and developmental purposes.
- Present and communicate the results of studies and investigations in a clear, comprehensive and informative manner, and in a variety of formats, including oral and poster presentations, written reports, maps, tables etc.
- Identify an appropriate problem or field of inquiry and design and implement a research project, using suitable research methods and techniques for data collection, analysis and interpretation.
- Develop a team working ethic and engage in scientific discussion with peers and seniors.
- Develop an appreciation for sustainable practices and social responsibility in environmental issues.

Statistics and Operations Research

At the end of the course you will be able to:

- deal competently with the notions of uncertainty and randomness in a logically valid and mathematically sophisticated way
- know which branch of relevant theory should help in understanding practical problems involving probabilistic, statistical and operations research contexts
- be confident in the use of software commonly used in the numerical solution to problems in the relevant areas.