Study Units for the Honours BA and BSc degree (with specialisation in Environmental Management)

(offered by the Department of Environmental Sciences)
Telephone number 012 352 4271

1 Syllabus

HESRMEC  Research methodology
Purpose: to undertake the basic steps of the research process with the final outcome being the completion of a research proposal. Qualifying students can select a topic, conduct a literature review and use appropriate basic methodological approaches to research. Students are prepared for further postgraduate study.

PGT401H  Project management
Purpose: to introduce students to the generic principles of project management, the project life cycle, suggested steps in the generic project life cycle, the role of the project manager and the project team are all covered in this subject. All of this is done within a South African context and by using generic, but South African examples.

HESIEM5  Integrated environmental management
Purpose: to enable students to understand the objectives of integrated environmental management (IEM), namely, to achieve integrated environmental governance and a holistic and integrative consideration of all the relevant parameters that influence environmental planning. As a result, the basic principles, guidelines, and tools commonly used in IEM will be investigated as well as key international environmental conventions and agreements. Students will gain an understanding of the different African countries’ implementation of international IEM agreements. Students will also gain practical experience through participation in an environmental management project.

HESIMMN  Impact mitigation and management
Purpose: to familiarise students with the compilation of Environmental Management Plans (EMP) for new developments, upgrading or expansion of already existing developments or facilities. They will learn to compile Environmental Management Programme Reports (EMPR) for mining activities. Students will also learn how to and in which circumstances to apply mitigation in order to minimise effects on the environment as well as how these mitigation measures will be managed in order to conserve the environment after closure of the development. Students will integrate this knowledge to make recommendations where development takes place in order to rehabilitate the environment after closure and decommissioning. Case studies will be presented to provide the student with practical examples of mitigation measures, rehabilitation, closure and decommissioning.

HESIMSU  Integrated environmental management systems and auditing
Purpose: to enable students to understand 21st century thinking in terms of environmental management systems (EMS); what these are, what led to their development and what ISO 9001, 14001 and 18001 certification means. The students will be guided through the complete process of planning and implementing an ISO 14001 management system, as well as evaluating and improving it by means of reviews, corrective action and continual improvement. The students will also be introduced to the aspect of regulatory compliance auditing.

HESE5AA  Ecological and social impact assessment
Purpose: to investigates the principles and techniques that are utilised in ecological and social impact assessment at a local scale or regional scale. It presents the student with both the theory as well as the practical application of appropriate ecological and social impact assessments methodologies.

HESERA8  Environmental risk assessment and management
Purpose: to enable students to identify hazards that may cause harm to humans, plants and animals and to understand and assess their effect on the environment; to evaluate and characterise the risk so that appropriate plans and strategies can be devised for the effective mitigation and management of environmental risk. The students will be equipped with the tools and techniques used to evaluate environmental risk based upon the principles set out in the international and national regulatory frameworks. Students will be guided through the complete process of planning and implementing an environmental risk assessment and management plan.

HESEMOC  Environmental monitoring
Purpose: to use various techniques to measure and monitor environmental variables in terms of measurement of all the variables of the natural phenomena for environmental monitoring. Measurement techniques as well as descriptions of instruments and the quality/accuracy of the data they produce are included in this competence.

HESRSMY  Environmental remote sensing and modelling
Purpose: the student will use remote sensing as a tool to monitor and model terrestrial and aquatic environments, to detect environmental change and to utilise remote sensed images to solve environmental problems.

HESETX5  Ecotoxicology
Purpose: to introduce the field of Ecotoxicology; the effect of pollutants on the ecosystem, routes of uptake, methods of testing for toxicity, factors influencing toxicity and remediation measures. Students will integrate this knowledge to make recommendations on the potential effects of pollutants and on remediation measures.

HESCCE6  Conservation ecology
Purpose: to highlight the importance and value of biodiversity as well as review the basic concepts of ecology. The student will be introduced to the field of macroecology and the linkages between ecology and conservation. International treaties and conventions relating to conservation ecology will be
discussed together with the threats to species and communities. Conservation principles and strategies, the classification of conservation areas, indicator, rare and endangered species, ecological monitoring, impact assessment and the human dimension of conservation ecology will also be investigated. A number of interesting and informative case studies will be included as part of this module.

**HESFESY  Fundamentals of environmental science**

*Purpose:* to introduce students to basic knowledge of earth system science. The complex integration and mechanisms linking the atmosphere, biosphere, hydrosphere and geosphere and the sustainable utilisation of the natural resources will be studied. The protection of biodiversity as well as addressing environmental issues to ensure a sustainable living environment will be dealt with in an integrated, holistic manner.

**HESRPX  Research project**

*Purpose:* to conduct independent research with the continuous guidance of a supervisor/study leader. Students are prepared for a research-based Master's degree and for a career in research.

The student will be required to submit a research report on a specific environmental science project that he/she has undertaken, preferably in the area where the student resides. It will give the student the opportunity to integrate creatively all the knowledge and skills he/she has acquired during the entire study period and to apply these to a real-world problem.