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ENVIRONMENTAL SCIENCES

Environmental Literacy - ENL1501

Higher Certificate	Semester module	NQF level: 5	Credits: 12
Module presented in **English**		Module presented online	

Purpose: The purpose of this module is to equip students with the knowledge, skills and tools to make responsible environmental decisions in their daily living. Those who achieve this module can: explain the interrelationships between humans and their environment; apply the principles of bio resource conservation and management; develop a responsible approach to the utilisation of consumer products; and manage waste to promote waste minimisation and responsible disposal.

Integrated Environmental Management Systems and Auditing - HES4811

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

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, ISO 14001 and ISO 45001 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.

Fundamentals of Earth Sciences - GEL1503

Under Graduate Degree	Semester module	NQF level: 5	Credits: 12
Module presented in **English**		Module presented online	

Purpose: TBy completing this unit, standard students should acquire knowledge and competencies underpinning the understanding of the Earth as a system consisting of interrelating subsystems such as climate- and plate tectonic systems. Students will acquire knowledge of the internal processes of Earth, such as mantle convection as a mechanism of energy transfer, and its external expression like the movement of plates as a surface manifestation. The latter is expressed in the Plate Tectonic theory that describes the movement of the plates, and the underlying forces driving the destruction and creation of lithosphere plates. The interaction between the systems of the lithosphere, asthenosphere, hydrosphere, and atmosphere is of utmost importance for the biosphere - where humans and their activities have a major impact. To be able to evaluate this impact the students should acquire a deep understanding of the surface processes taking place on, and in the Earth's crust, such as mass wasting and transportation of material via streams to the ocean. In addition, students should acquire a basic knowledge of research methodologies, together with writing and reporting skills befitting the NQF level 5. Students should also be able to respond on ethical issues regarding human activity and the impact it has on Earth as a system. Students who enter this unit standard must preferably have successfully completed the following bodies of knowledge on NQF level 4: geography, mathematics, and natural science.

Ecological and Social Impact Assessment - HES4812

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

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

Soil Science I - SSC1501

Diploma	Semester module	NQF level: 5	Credits: 12
Module presented in **English**			

Purpose: To provide students with information on the nature of soils and to equip them with the ability to assess soils for their suitability for growing plants and make basic recommendations for managing soils. Students who complete this module can assess soil to determine its condition and its suitability for plant growth, and can make basic recommendations for managing and, where necessary, for improving soil productivity.

Environmental Science Research - HRENS80

		NQF level: 8	Credits: 36
Module presented in		Module presented online	

Purpose: of this module is to equip students with the knowledge and skills required to undertake a basic scientific research project. This involves planning, executing and compiling a scientific project. A project requires the development of a research proposal with appropriate methods and grounded scientific literature appropriate for the proposed research project. Students are expected to identify a suitable research area, choose a topic, write a proposal, execute the project as proposed and write up a scientific report. In the report execution phase, the student must use appropriate scientific.

Soil Pedology and Classification II - SSC2601

Diploma	Semester module	NQF level: 6	Credits: 12
Module presented in **English**			

Pre-requisite: CHE1501 & CHE1502 (Not applicable to NDAGR & 90097).

Purpose: To enable students to understand the importance of soils to not only agricultural and conservation practices but also to urban development and the ecological functioning of the planet. It will promote the implementation of good soil management by providing sound, holistic training in pedology and soil classification. Qualifying students will be able to demonstrate comprehension of the origin of soils, weathering of rocks and minerals, soil classification systems, soil properties and soil chemistry principles.

Research Project - HRENV80

Honours		NQF level: 8	Credits: 36
Module presented in **English**			

Purpose: To equip students with the knowledge and skills required to undertake the basic steps of the research process which will lead to the completion of a research project. Students will be mentored in the art of conducting research under the guidance of an allocated supervisor. Qualifying students can select a topic that is appropriate for the discipline of Environmental Management. They need to conduct a literature review, choose a research design, collect data and represent the analysed data. Students completing this module will be required to submit a research project in the form of a research report on the chosen topic.

Climate Mitigation and adaptation - CMA4801

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

Purpose: is to equip students with knowledge, skills and competencies to: critically interrogate the principium drivers of both human and naturally induced climate change.

Research Project - HRENV83

Honours		NQF level: 8	Credits: 36
Module presented in **English**		Module presented online	

Purpose: To assist students complete the research component of their Honours Degree. Students are mentored in the art of conducting research and undertake research activities under the guidance of a supervisor. Students are guided to select a topic, conduct a literature review and basic scientific methodological approaches to research. The students then undertake the proposed research and submit a mini-research report. This process will enable students to understand and acquire basic knowledge and skills for conducting research and applying them to solve real-world problems within the scope of sustainability. The module is intended to help prepare students for further postgraduate studies and the world of work.

Environmental Access, Livelihoods and Resettlement - ENL4801

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

Purpose: of this module will delve into issues of environmental access and justice in order to apply this knowledge to infrastructure projects and resettlement plans in order to minimise negative ecological, economic and social impacts and maximise positive impacts on interested and affected parties.

Integrated Natural Resource Management - NAT4804

Honours,Post Graduate Diploma	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

Purpose: This module is intended for students pursuing a career in nature conservation, environmental management or the natural sciences which will be faced with the challenge of managing natural resources in and around protected and / or conservation areas that are inhabited by local communities. The purpose of the module is to enable students to develop a good understanding of integrated natural resource management as well as the challenges associated with including local communities in environmental management plans of protected and /or nature conservation areas. Students will be provided with the necessary theoretical and practical skills to establish, manage and monitor integrated resource management projects especially aimed at biodiversity and resource conservation.

Green Economy for Environmental Managers - GRE4801

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

Purpose: of this module is to preapre learners with the skills and knowledge to engage with, identify opportunities in and contribute to the development of a green economy at national and local levels. This entails the development of an understanding of the theory, and the concept of a green economy, particularly key principles, policies and practises thereof at numerous levels of application.

Stakeholder Engagement for Environmental Managers - SEN4801

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**			

Purpose: of this module is to equip students with knowledge, skills and competencies to facilitate meaningful stakeholder engagement, communicate effectively with all stakeholders and manage stakeholder conflicts so as to contribute to sustainable environmental management.

Earth Systems and Processes - HES4801

Honours	NQF level: 8	Credits: 12
Module presented in **English**	Module presented online	

Purpose: The purpose of the learning is 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 utilization 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.

Environmental Monitoring - HES4802

Honours	NQF level: 8	Credits: 24
Module presented in **English**	Module presented online	

Recommendation: CHE1501

Purpose: To provide students with the analytical and technical skills as well as the practical experience necessary to investigate and assess manmade or natural environmental changes and impacts in a scientific context. Different forms of pollution and how they impact environmental quality will be examined. Through various case-studies and practical sessions, students will be able to understand the value of scientific approaches when collecting, processing, and interpreting environmental data and information for various applications.

Ecotoxicology - HES4803

Honours	NQF level: 8	Credits: 24
Module presented in **English**	Module presented online	

Recommendation: First year Chemistry/Biochemistry

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.

Advanced Environmental Management - HES4804

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

Purpose: The purpose of this module is to enable students to develop competencies and skills in understanding the impact of civil engineering activities on the natural environment, as well as the legislative context and the science that underpins environmental systems, which must be protected from anthropogenic impacts. This module seeks to promote environmental responsibility, a precautionary approach to development and encourages students to incorporate environmentally friendly technologies into the design, development and operation of civil engineering projects in line with the United Nations Global Compact (UNGC) principles.

Environmental Remote Sensing and Modelling - HES4806

Honours	NQF level: 8	Credits: 24
Module presented in **English**	Module presented online	

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.

Conservation Ecology - HES4807

Honours	NQF level: 8	Credits: 24
Module presented in **English**	Module presented online	

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 macro-ecology 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.

Environmental Risk Assessment and Management - HES4808

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

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 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.

Integrated Environmental Management - HES4809

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

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 management. 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 also gain practical experience through an assignment relating to the environmental management process.

Impact Mitigation and Management - HES4810

Honours	Year module	NQF level: 8	Credits: 12
Module presented in **English**		Module presented online	

Purpose: To familiarise students with the compilation of Environmental Management Programme Reports (EMPr) 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.

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