

**Department of Geography and Environmental studies**

**Academic Offerings**

**Undergraduate offerings**



**First Year**

<b>SAIR 011</b> <b>Air Photo Reading</b>	<b>Credits: 8</b>	<b>Co-requisite / Prerequisite:</b> <b>Admission requirements</b>
<b>Content:</b> The origin and development of aerial photography, Types of Air Photos, Principles of air photo reading and measurements, Recognition of elements, Air Photographic instrumentation, stereoscopy and mosaics, Elementary Photogrammetry, Scales and scale determination, Area determination Distance measurements, Uses of air photos, Methods of modern air photo production		

<b>SCAR011</b> <b>Cartographic Techniques</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>Admission requirements</b>
<b>Content:</b> History and nature of cartography, Earth-map relations, Cartographic designs, Types and uses of maps, Map reading and interpretation.		

<b>SGES011</b> <b>Introduction to The Physical Environment</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>Admission requirements</b>
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<b>Content:</b> Physical geography concepts, The history of the earth, Natural components of the earth as a system, (Lithosphere, Hydrosphere, Atmosphere, Pedosphere and Biosphere), Landforms and land forming processes		
<b>SGES012</b> <b>Introduction To The Human Environment</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>Admission requirements</b>
<b>Content:</b> The nature and scope of the Human Environment, Population issues, Human Settlements, Human economic activities, The Geo-political landscape		

<b>SGEO012</b> <b>Regional Studies</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>Admission requirements</b>
<b>Content:</b> The physical of natural environmental of South Africa, Human settlement in South Africa, Population dynamics of South Africa, Human settlement in South Africa, The socio-economic landscape of South Africa South Africa, Geopolitical landscape of South Africa		

## Second year

<b>SGEA021</b> <b>Computer-Assisted Cartography</b>	<b>Credits: 4</b>	<b>Co-requisite / Prerequisite</b>  <b>SCAR011</b>
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**Content:** Introduction to Computer-assisted Cartography (CAC), Overview on Data Collection, entry and display, Introduction to Microsoft excel, Introduction to Cartographic Semiology, Internet based mapping

<b>SENA021</b> <b>Environmental and Resource Management</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>SGES011</b> <b>SGES012</b>
<b>Content:</b> The natural environment as a resource, Introduction to principles of and tools for resource management, Classification of natural resources, Approaches to resources management, Introduction to the various challenges facing natural resources, World natural resource map, Resources and Sustainable development		

<b>SGEB021</b> <b>Introduction to Geomorphology</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b> <b>SGES011</b>
<b>Content:</b> The meaning of geomorphology, The components of land- geology/lithology, slopes and slope materials, Sources of energy for geomorphic processes Systems in geomorphology, Slopes and theories of slopes development; Evolution of fluvial landscapes, Primary rock forming minerals – types, composition and formation, Stresses in rocks		
<b>SGEC021</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b>

<b>Quantitative Techniques in Geography I</b>		<b>SGES011</b> <b>SGES012</b>
<p><b>Content:</b> Terminologies/concepts: quantitative techniques; statistics; data and data values; variable types; populations and samples; statistics and parameters; measurement; Scales of measurement and their importance in data collection and analyses; Measures of central tendency for ungrouped and grouped data sets; Measures of deviation and variability for ungrouped and grouped data sets; types, uses and their advantages and disadvantages; some standard deviation checks; Grouping of data into frequency distributions and their uses in summarizing and presenting data; skewness and kurtosis; The normal distribution; its characteristics and uses in using sample statistics to estimate population parameters by standardizing raw data.</p>		

<b>SGEB022</b> <b>Demographic and Population Studies</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>SGES012</b>
<p><b>Content:</b> Spatio-temporal characteristics of population, Patterns of population distribution, Population projection techniques, Effects of fertility and mortality on development, Epidemiology and diseases, Environmental health and health promotion policies, Health care delivery, International and national migration and development, Population growth, resource demand and environmental management, Models of population composition and structure, Population growth and planning</p>		

<b>SGEC022</b> <b>Economic Geography</b>	<b>Credits: 8</b>	<b>Co-requisite / Prerequisite:</b> <b>SGES012</b>
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**Content:** The concepts and terms in economic geography, Spatial organization of economic activities on both a homogeneous and heterogeneous surfaces, Economic theories and models, Geographic analysis of economic activities.

<b>SENA022</b> <b>Introduction to Climatology</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b> <b>SGES011</b>
<b>Content:</b> The History of meteorology and Weather observations, Energy and moisture distribution in the atmosphere, Stability, instability and vertical motions, Weather Observations and Informatics, Weather systems, Climate classification,		

<b>SGEA022</b> <b>People, Space and Environment</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>SGES011</b> <b>SGES012</b>
<b>Content:</b> The physical background of the African continent, Africa's socio-economic dynamics, The physical background of the world, Global socio- economic dynamics, Topical world political, economic and environmental challenges		

<b>SGED022</b> <b>Introduction to Remote Sensing and GIS</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b> <b>SCAR011</b>
<b>Content:</b> Definition, development and interdisciplinary of GIS, Components and capabilities of a GIS, Data capture, quality, entry and analysis, Map projection systems, Spatial representation concepts, Principles and development of remote sensing, Energy sources and electromagnetic spectrum, Energy interactions in the atmosphere, Forms of remote sensing, Platforms, Sensor types and characteristics, Digital image processing and classification		

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### Third year

<b>SENA031</b> <b>Applied Climatology</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b> <b>SENA022</b>
<p><b>Content:</b> Urban Climatology, Agro climatology, Hydro climatology, Climate variability and change, Mitigation and adaptation strategies to climate change</p> <p>The analysis of climatic data, Indigenous knowledge systems and weather prediction</p>		

<b>SGEB031</b> <b>Applied Geomorphology</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b> <b>SGEB021</b>
<p><b>Content:</b> Rock weathering processes: factors, products/landforms; Slope removal processes: factors, landforms &amp; implications for environmental management; Fluvial Geomorphology; Stream/Open channel flows: factors, Process geomorphology landforms &amp; applications in environmental management; Coastal and glacial geomorphology &amp; the effects of climate change; natural hazards-magnitudes and frequencies</p>		

<b>SGEA031</b> <b>Human Settlements</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>SGEB022</b>
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**Content:** Origins of settlements, Dynamics of rural landscapes, Dynamics of urban landscapes, Spatial interaction between rural and urban systems, Human settlement planning and policy,

<p><b>SGEC031</b> <b>Quantitative Techniques in Geography II</b></p>	<p><b>Credits: 12</b></p>	<p><b>Co-requisite / Prerequisite:</b> <b>SGEC021</b></p>
<p><b>Content:</b> Hypothesis testing: Parametric &amp; non-parametric statistics for independent and related or paired samples; The U-test for small, medium &amp; large samples; The Chi-Square tests: One samples cases – for equal expected frequencies and for unequal expected frequencies; the case for testing the normality of observed distributions; The cases of two or more variables (contingency tables);The Kruskal-Wallis Analysis of Variance; The Wilcoxin test; The t-tests; The F test (Variance-ratio test); Simple bivariate correlation &amp; linear regression analyses; Time Series analysis; Indices of Concentration; Dissimilarity and diversification; Network analyses; Use of statistical packages for data analysis.</p>		

<p><b>SENB031</b> <b>Tourism Studies</b></p>	<p><b>Credits: 8</b></p>	<p><b>Co-requisite / Prerequisite:</b> <b>SGEC022</b></p>
<p><b>Content:</b> Introduction to terms, concepts and models of tourism, the principles of sustainable tourism development, Techniques for assessing sustainable tourism development, Impacts of Tourism development, Ecotourism, Trends in global tourism</p>		

<b>SENA032</b> <b>Environment, Resource Planning and Management</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>SENA021</b>
<b>Content:</b> Natural Resource development concepts, Natural resource exploitation and environmental impacts, Approaches to natural resources management Natural resources conservation, Natural resources management legislation		

<b>SENB032</b> <b>Impacts Studies</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite:</b> <b>SENA021</b>
<b>Content:</b> Key environmental management concepts and tools, History of Environmental movements and Environmental Assessments, Impact types, identification and assessment, Steps and elements of Environmental Impact Assessment, Environmental Assessments Legislation in South Africa- status and challenges, assessing projects for possible impacts and preparation of reports thereafter (a practical example), Comparative study on developing and developed state of environmental Assessments		

<b>SENC032</b> <b>Natural Resource Ecology</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b> <b>SENA021</b>
<b>Content:</b> Ecological succession, Ecosystem structure and function, World Terrestrial and aquatic ecosystems, The dynamic of South African ecosystems, Health of ecosystem - indicators and techniques of measurements		

<b>SGEA032</b>	<b>Credits: 16</b>	<b>Co-requisite / Prerequisite:</b>
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<b>Remote Sensing and GIS Applications</b>		<b>SGED022</b>
<p><b>Content:</b> Introduction to GIS and Remote Sensing applications; Designing and managing a GIS database; Spatial data analysis; Data acquisition and processing in Remote Sensing; Image classification and accuracy assessment; GIS and RS application in Environmental planning and management; The state of GIS and RS applications in developed and developing countries</p>		

<b>SEND032 Solid Waste Management</b>	<b>Credits: 12</b>	<b>Co-requisite / Prerequisite: SENA021</b>
<p><b>Content:</b> Introduction to key concepts; Solid waste classification; Solid waste management processes; Solid waste management and related environmental impacts; Solid waste legislation and governance in South Africa; Community awareness and participation in solid waste management.</p>		

#### Fourth year

<b>SENA041 Elements of Environmental Management</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite: SENB032</b>
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**Content:** Introduction to environmental management, Environmental philosophy and ethics, Environmental administration with reference to South Africa, The role of legislations in promoting environmental management, Integrated environmental management procedures – Environmental Impact Assessment, Strategic Environmental Assessment, Social Impact Assessment, Environmental Economics, Environmental Auditing, Social Impact Assessment, Environmental Management Systems, Cost-Benefits analysis, etc., Introduction to Agenda 21, Environmental laws and international relations

<b>SGEA041</b> <b>Geographical Information Systems</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>SGEA032</b>
<b>Content:</b> Geostatistical analysis and Spatial modelling techniques, Spatial database design and manipulation, Positional accuracy and error assessment and management, Time series and digital change techniques, Multi criteria analysis, Image pre-processing, Data Fusion, Vegetation Indices Advanced image Classification, GIS and RS project design and management, GIS and Remote Sensing Applications		

<b>SENB042</b> <b>Advanced Natural Resource Ecology</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>SENC032</b>
<b>Content:</b> Forest Ecology, Wetland Ecology, Grassland Ecology, and Ecology of Invasive Species		

<b>SGEA042</b> <b>Demographic Studies</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>SGEA031</b>
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**Content:** Approaches, methodologies and paradigms in the study of population, Sources and quality of demographic data, The analysis of population characteristics, Measurement of population dynamics and associated problems, Population-resources relationships, Population policies

<b>SENA042</b> <b>Land Degradation</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>SENC032</b>
<b>Content:</b> Definition and scope of land degradation; Components of land – lower atmosphere, geology, soil, vegetation and water bodies; Anthropogenic and natural land degradation processes; Factors of land degradation; Management practices and policies to prevent and mitigate degradation problems		

<b>SENC042</b> <b>Sustainable Resource Development</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>SENA032</b>
<b>Content:</b> The concept of Sustainable development, Sustainability indices, Environmental resources and uses, Consequences of resource ownership and scarcity, Strategies for sustainable resource development, Case studies of sustainable resource development projects		

<b>SEND042</b> <b>Waste Management</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>SEND032</b>
<b>Content:</b> Key issues in waste management; Landfill site design, management and associated risks; Approaches to sustainable waste management;		

Waste management legislation and governance; Integrated pollution and waste management strategy for South Africa; Case studies of waste management practices in Limpopo province

<b>SENRO40</b> <b>Research Project</b> <b>(Environment and Resource Studies)</b>	<b>Credits:40</b>	<b>Co-requisite / Prerequisite:</b>  <b>All level three modules</b>
<b>Content:</b> Quantitative and qualitative research methods and Proposal writing Research report		

### **BSc (Honours) in Geography and Environmental Studies**

<b>SGEA082</b> <b>Elements of Environmental Management</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b>  <b>Impacts Studies or Equivalent at level three</b>
<b>Content:</b> Introduction to environmental management, Environmental philosophy and ethics, Environmental administration with reference to South Africa, The role of legislations in promoting environmental management, Integrated environmental management procedures – Environmental Impact Assessment, Strategic Environmental Assessment, Social Impact Assessment, Environmental Economics, Environmental Auditing, Social Impact Assessment, Environmental Management Systems, Cost-Benefits analysis, etc., Introduction to Agenda 21, Environmental laws and international relations		

<b>SGEB081</b> <b>Geographical Information Systems Applications</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>Remote Sensing and GIS at level three</b>
<b>Content:</b> Geostatistical analysis and Spatial modelling techniques, Spatial database design and manipulation, Positional accuracy and error assessment and management, Time series and digital change techniques, Multi criteria analysis, Image pre-processing, Data Fusion, Vegetation Indices Advanced image Classification, GIS and RS project design and management, GIS and Remote Sensing Applications		

<b>SGED081</b> <b>Natural Resource Ecology</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>Natural Resource Ecology or equivalent at level three</b>
<b>Content:</b> Forest Ecology, Wetland Ecology, Grassland Ecology, and Ecology of Invasive Species		

<b>SGEC081</b> <b>Demographic Studies</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>Population and Demographic studies or equivalent at level three</b>
<b>Content:</b> Approaches, methodologies and paradigms in the study of population, Sources and quality of demographic data, The analysis of population characteristics, Measurement of population dynamics and associated problems, Population-resources relationships, Population policies		

<b>SGEB082</b> <b>Land Degradation</b>	<b>Credits:20</b>	<b>Co-requisite / Prerequisite:</b> <b>Natural Resource Ecology or equivalent at level three</b>
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<p><b>Content:</b> Definition and scope of land degradation; Components of land – lower atmosphere, geology, soil, vegetation and water bodies; Anthropogenic and natural land degradation processes; Factors of land degradation; Management practices and policies to prevent and mitigate degradation problems</p>		

<p><b>SGEE081</b> <b>Sustainable Resource Development</b></p>	<p><b>Credits:20</b></p>	<p><b>Co-requisite / Prerequisite:</b> <b>Environmental and Resource Management or equivalent at level three</b></p>
<p><b>Content:</b> The concept of Sustainable development, Sustainability indices, Environmental resources and uses, Consequences of resource ownership and scarcity, Strategies for sustainable resource development, Case studies of sustainable resource development projects</p>		

<p><b>SGEC082</b> <b>Tourism and Development</b></p>	<p><b>Credits:20</b></p>	<p><b>Co-requisite / Prerequisite:</b> <b>Tourism studies at level three</b></p>
<p><b>Content:</b> Introduction to terms, concepts and models of tourism, The principles of sustainable tourism development, Techniques for assessing sustainable tourism development, Impacts of Tourism development, Ecotourism, Trends in global tourism</p>		

<p><b>SGEA081</b> <b>Development of Philosophy and Methodology in Geography</b></p>	<p><b>Credits:20</b></p>	<p><b>Co-requisite / Prerequisite:</b> <b>Undergraduate Geography</b></p>
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**Content** Theoretical foundations of Modern Geography – Geography in the Ancient World, Geography in the Middle Ages, Geography in the Industrial Revolution, Geography in the twentieth century; Geographic Themes – Development of Geography as a Science, Major Methodological and Philosophical Debates in Geography; Major Themes in Contemporary Research

<p><b>SGEO080</b> <b>Research Project</b></p>	<p><b>Credits:40</b></p>	<p><b>Co-requisite / Prerequisite:</b>  <b>Degree in Geography or equivalent</b></p>
<p><b>Content:</b> Quantitative and qualitative research methods and Proposal writing Research report</p>		