

SECTION 6

CURRICULUM AND SYLLABUSES AS IT WILL APPEAR IN THE PROSPECTUS

Programme title:

Bachelor of Science Honours in Natural Resource Management

Programme Purpose:

This qualification will serve to consolidate and deepen the student's expertise and theoretical knowledge in a particular discipline (forestry, agriculture, nature conservation or socio-ecological systems), and to develop capacity in the research methodology and techniques of that discipline.

Programme outcomes:

1. Critically analyse and explain the inter-relatedness of social, economic and biophysical environments and their influences in the broad discipline of sustainable Natural Resource Management. (Students will be exposed to the broader global natural resource management environment, yet deeply rooted in local resource and management aspects.)
2. Critically analyse, review and interpret contemporary issues and challenges related to one of the following four areas: Forest Management, Agricultural Management, Conservation Management and Socio-Ecological Systems.
3. Conduct research in Natural Resource Management.
4. Provide solutions to support sustainable management of natural resources in the southern African context.

Admission requirements:

An Advanced Diploma in Forestry, Wood Technology, Nature Conservation, Agricultural Management or Game Ranch Management or an equivalent qualification.

Duration of Study:

One year

Re-admission:

Students need to apply for re-admission in writing. The specific circumstances of the applicant will be considered by the Director of School and Programme Coordinator. Progress-based criteria will apply as approved by Senate.

Curriculum

Module Name	Module Code	When Presented	Credit Value	NQF Level
<u>Compulsory:</u>				
Statistical Techniques for Research	FAB500	Year	20	8
Research Project	FRP500	Year	35	8
Principles of Sustainability	FSB500	Year	25	8
<u>Electives:</u>				
Forest Management	FMN500	Year	40	8
Agricultural Management	FAM500			
Conservation Management	FCM500			
Socio-ecological Systems	FSE500			

Syllabuses of all modules as it will appear in the prospectus:

MODULE CODE
FAB500

MODULE NAME
Statistical Techniques for Research

CREDITS
20

PURPOSE

The purpose of the module is to develop research capacity in the appropriate methodology and statistical methods, as applied in practice.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Analyze the relationships between variables.
- Describe statistical methods, objectives, theoretical models and statistical tests.
- State the theoretical model and defining each term in the model for each of the regression analysis and ANOVA techniques covered.
- Apply each model covered to the data using Microsoft Excel, Statistica or R.
- Extract relevant information from the software output to perform the statistical test associated with each of the regression analysis and ANOVA techniques covered.
- Interpret the results associated with each statistical test associated with each of the regression analysis and ANOVA techniques covered.
- Perform the statistical test associated with each of the categorical data analysis and non-parametric statistics techniques covered manually or using Microsoft Excel, Statistica or R.
- Interpret the results associated with each statistical test.
- Develop questionnaires related to specific research questions.

CORE CONTENT

- Regression Analysis
 - Simple Linear Regression Analysis
 - Multiple Linear Regression Analysis
 - Non-linear Regression Analysis (quadratic, exponential, sigmoid)
- Analysis Of Variance
 - Single factor, independent measures design
 - Single factor, repeated measures design
 - Two factors, randomized complete block design
 - Factorial experiment, two factor completely randomized experiment.
- Categorical Data Analysis
 - Chi Square Goodness of Fit Test
 - Chi Square Test for Independence
 - Chi Square Test for Homogeneity
 - Odds Ratio
 - Kolmogorov-Smirnov One Sample Test
 - Kolmogorov-Smirnov Two Sample Test
- Transformations (log10, arcsine, square root)
- Introduction to multi-variate analysis
- Non Parametric Statistics
 - Sign Test
 - Wilcoxon Matched-Pairs Signed Ranks Test
 - Mann-Whitney U Test
 - Kruskal-Wallis One Way ANOVA Test by Ranks
 - Friedman Two Way ANOVA Test by Ranks

- Spearman Rank Correlation Coefficient

ASSESSMENT

This module will be assessed during an examination in November. The duration of the examination paper will be 2 hours. Final mark calculated as 70% class mark + 30% examination mark.

MODERATION

External

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None

MODULE CODE
FRP500

MODULE NAME
Research Project

CREDITS
35

PURPOSE

To equip students with appropriate knowledge and skills to conduct problem-driven or trans-disciplinary research and present a treatise.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Develop a hypothesis based on an identified research question in a relevant discipline associated with Natural Resource Management (Forestry, Nature Conservation, Agriculture, Socio-ecological systems)
- Conduct a relevant review of literature, framing the research problem or question
- Prepare a research design with appropriate research methodologies/paradigms
- Either:
 - collect and analyse data and present and interpret the research output, or
 - extend the literature review to include a critical analysis of existing ideas and theories, drawing some new conclusions or making suggestions.
- Draft, edit and present a treatise in the appropriate format.

CORE CONTENT

- Research design
- Literature reviews
- Research methodologies
- Scientific writing
- A treatise of approximately 50-70 pages (+/- 15 000 words) based upon a topic in the selected research area and with evidence of substantive quantitative and/or qualitative data analysis and interpretation.

ASSESSMENT

Continuous assessment. Final mark calculated from verbal presentations (30%) and written report (70%).

MODERATION

None

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None

MODULE CODE	MODULE NAME	CREDITS
FSB500	Principles of Sustainability	25

PURPOSE

To enhance theoretical understanding as well as critical, analytical and problem solving competence to contribute to sustainable management of natural resources.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Analyze and critically discuss the state of the environment, both locally and globally
- Conceptualize and explain sustainable natural resource management
- Explain the contribution of biodiversity towards ecosystem services
- Explain the importance of human well-being towards sustainable socio-ecological systems
- Explain the importance of resource economics towards sustainable socio-ecological systems
- Analyze and explain different forms of ethics and values emanating from human society
- Identify, analyze and explain constraints and associated opportunities relevant to sustainable natural resource management
- Analyze and critically discuss strategies in corporate environmental governance to support sustainability
- Analyze and critically discuss pathways in national governance and public policy to support sustainable natural resource management
- Interpret the principles of Adaptive Management to ensure the sustainable management of natural resources

CORE CONTENT

- Theory of sustainability
- Environmental science
- Social science
- Resource economics
- Environmental philosophy
- Corporate and national governance
- Adaptive management

ASSESSMENT

This module will be assessed during an examination in November. The duration of the examination paper will be 2 hours. Final mark calculated as 70% class mark + 30% examination mark.

MODERATION

External

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None

MODULE CODE
FMN500

MODULE NAME
Forest Management

CREDITS
40

PURPOSE

To enhance critical, analytical and problem solving competence within forestry by developing a systems thinking and integrative approach towards managing forestry production systems.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Analyze and explain the significance and interrelatedness of different components of sustainable forest production systems (both indigenous and plantation based systems) in order to supply desired quality products to the wood processing industry
- Analyze the risks (socio-economic and environmental) relevant to forest production systems and suggest strategies for prevention and mitigation
- Create a management plan for a specific forest production system focused on optimization of timber yield and quality, using modern forest production and environmental management principles.
- Write an argumentative essay on a forestry discipline related topic in an appropriate academic style to demonstrate intellectual and critical independent thinking

CORE CONTENT

- Market demands and product specifications
- Forest Site Classification and Evaluation
- Species and site occupancy
- Growth and Yield
- Stand Management and precision forestry
- Forest Engineering
- Timber Processing
- Value addition to wood-based products
- Environmental Management
- Certification systems
- Risk Management
- Forest Planning
- Management Plan
- Forest Protection

ASSESSMENT

This module will be assessed during an examination in November. The duration of the examination paper will be 2 hours. Final mark calculated as 70% class mark + 30% examination mark.

MODERATION

External

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None

MODULE CODE
FAM500

MODULE NAME
Agricultural Management

CREDITS
40

PURPOSE

To enhance critical, analytical and problem solving competence within agriculture by developing a systems thinking and integrative approach towards managing agricultural value chains.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Integrate agriculture knowledge and skills from various disciplines in order to solve problems in agriculture
- Critically analyze the performance and sustainability of agriculture businesses for continuous improvement
- Create comprehensive agri-business management plans
- Write an argumentative essay on an agriculture management related topic in an appropriate style

CORE CONTENT

- Food security
- Rural and urban agriculture
- Value chains and logistics
- Project Planning
- Finances and Resource Economics
- Value addition
- Ethics and governance
- Agro-ecology
- Trade, export, markets and certification systems
- Precision agriculture
- Management Plan

ASSESSMENT

This module will be assessed during an examination in November. The duration of the examination paper will be 2 hours. Final mark calculated as 70% class mark + 30% examination mark.

MODERATION

External

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None

MODULE CODE
FCM500

MODULE NAME
Conservation Management

CREDITS
40

PURPOSE

To enable evidence-based sustainable management of complex systems in the fields of ecology and biodiversity.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Assess and explain the functioning of complex ecosystem in terms of biodiversity patterns and ecological processes and the consequences of disturbance.
- Recognize wicked problems (a problem that is difficult to solve due to incomplete, contradictory and changing requirements) in conservation and consider innovative interventions.
- Evaluate and critically discuss conservation interventions in response to ecological crises.
- Gather and evaluate information from the literature and other sources to inform evidence based conservation management.
- Identify and measure suitable ecological indicators of ecosystem change to enable adaptive management as a form of evidence based conservation management.

CORE CONTENT

- Biodiversity
- Conservation interventions (Protected areas, Community based conservation, Stewardship)
- Conservation planning
- Conservation regulation and Certification
- Threats to nature conservation
- Collection and evaluation of information
- Techniques to measure ecological indicators for adaptive management

ASSESSMENT

This module will be assessed during an examination in November. The duration of the examination paper will be 2 hours. Final mark calculated as 70% class mark + 30% examination mark.

MODERATION

External

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None

MODULE CODE
FSE500

MODULE NAME
Socio-ecological Systems

CREDITS
40

PURPOSE

To facilitate integrated socio-ecological systems thinking, and to critically engage and reflect on complexity so as to adaptively manage these systems.

LEARNING OUTCOMES

On successful completion of this module the student will be able to:

- Classify different types of systems (simple, complex, and chaotic).
- Identify and model the different components of an integrated complex social ecological system.
- Critically analyze a social ecological system case study.
- Recommend and apply different management approaches to integrated social ecological systems (adaptive governance, adaptive co-management, strategic adaptive management, etc.).
- Appraise and apply key concepts, theories and methodological approaches for undertaking socio-ecological research and strategic management in specific case studies.
- Identify different research paradigms or approaches for socio-ecological research.
- Identify different research methods applicable to complex socio-ecological systems.

CORE CONTENT

- Types of socio-ecological systems and frameworks
- Key concepts in socio-ecological systems
- Theories in socio-ecological systems
- Management methods for socio-ecological systems
- Specialized research methods
- Research paradigms, including Positivism, Constructivism and Interpretivism
- Research methods such as Mixed-methods, Interviews, Focus Groups, Questionnaires, Social network analysis, Stakeholder engagement, etc.

ASSESSMENT

This module will be assessed during an examination in November. The duration of the examination paper will be 2 hours. Final mark calculated as 70% class mark + 30% examination mark.

MODERATION

External

PRE-REQUISITES FOR THIS MODULE

None

CO-REQUISITES FOR THIS MODULE

None