



NATURAL AND
AGRICULTURAL SCIENCES

COME AND EXPLORE OUR NATURAL AND COMPLEX SYSTEMS WITH OUR BSc, PGDip, MSc AND PhD IN ECOLOGICAL AND NATURE-BASED ENGINEERING SCIENCES AT THE UFS

NATURAL COMPLEXITY REVEALED THROUGH ECOSYSTEM SERVICES

With a keen focus on advancing and optimizing ecosystem services to the benefit of both humans and nature, the UFS degrees in Ecological and nature-based Engineering Sciences aim to equip candidates with skills in transdisciplinary collaboration, adaptive scientific methodologies, and grounded applications with design. We aim to decode natural system interdependencies, respond to uncertainties, and deliver nature-based solutions that sustain new generation resources and benefit communities. By unlocking systems-based insights, fostering inclusive innovation, and harmonizing science with lived experience, we aim to translate knowledge to societal value and impact.

www.ufs.ac.za

*Inspiring excellence, transforming lives
through quality, impact, and care.*



UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



UFS
NATURAL AND
AGRICULTURAL SCIENCES
ENGINEERING SCIENCES

Our degrees are endorsed by the International Ecological Engineering Society and the Ecological Engineering Institute of Africa. Ecological and nature-based Engineering Sciences intends to equip graduates with the relevant theory, knowledge, principles and competencies towards becoming an ecological engineering scientist, generating professionals who can apply design and computational methods to complex ecosystems.

MSc Ecological Engineering Sciences

- Attract national and international students
- Engage with real case studies in ecological engineering complexity
- Master complex systems design, ecological engineering science and integration for mutual benefit.

PhD Ecological Engineering Sciences

- Attract national and international students to become
- Experts in understanding and being able to predict phenomena typical of complex and dynamic systems
- Critical to progress in ecology and engineering science amidst escalating global environmental change.

**MSC | PHD
ECOLOGICAL
ENGINEERING
SCIENCES**

Existing 3-year Engineering Sciences

- BSc Physics with Engineering Subjects (Full Applied Science)
- Students pursue PG studies in Ecological Engineering Sciences related PG programmes

Existing Engineering Sciences Research Groups

1. Complexity science and High performance computing in ecological engineering
2. Green Concrete research (Waste beneficiation)
3. Circular Economy (Waste beneficiation and 3D concrete printing)
4. Hydro Science research groups (Water optimisation & Flood Risk)

**FUNDAMENTAL
ENGINEERING
SCIENCES**

ECOLOGICAL ENGINEERING SCIENCE

Research

- CSIR Chair in Ecological Engineering
- Astro ecological engineering
- Phyco systems
- Land and aquatic systems regeneration and restoration
- Industrial ecology
- Extreme biodiversity
- Chrono ecological engineering

Commercial

- Phyco products,
- High-value and novel impact products, novel mining, agriculture and industrial ecosystems and products.

**EXTREME
ECOLOGICAL
ENGINEERING
SCIENCES**

**PGDIP
ECOLOGICAL
ENGINEERING
SCIENCES**

PGDip (From 2027, process started)

- 136 credits, NQF 8, internationally ABET accredited
- Ecological and Nature-Based Engineering Design
- Principles of Ecological and Nature-Based Engineering sciences
- Computational Ecological and Nature-Based Ecology
- Civil, Industrial, and Nature-Based Engineering sciences
- Complex Systems in Ecological and Nature-Based Engineering Science
- Water, Biodiversity, and Nature-Based Ecosystems

CONTACT

DR JACQUES MARITZ
UNIVERSITY OF THE FREE STATE

+27 51 401 2076
maritzjm@ufs.ac.za



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