University of Pretoria Yearbook 2016

MSc Option: Environmental Management (Coursework) (03251037)

Duration of study	2 years
Total credits	180

Programme information

Coordinated by the Department of Zoology and Entomology.

The purpose of this focus area is to train environmental graduates considered generalists for managing the full spectrum of human-environment-economic interactions. On completion of the training, candidates should be conversant and be able to partake in, or render advice concerning, all aspects involved in managing social, economic and environmental processes in a sustainable manner. This includes social and environmental impact assessment, policy formulation, social development and planning, eco-system structure, composition and function, ecosystem services, ecosystem health, invasive species, species and community restoration, conservation education, local communities and conservation, economic inefficiency, misallocation, market failure, policy failure, the economics of renewable and non-renewable resources, cost-benefit analysis, valuation of environmental goods and services and environmental accounting.

There are two independent foci of the master's option in Environmental Management:

- Focus area: Sustainable Development
- Focus area: Environmental Economics

The MSc degree is conferred on the grounds of a dissertation and such additional postgraduate coursework as may be prescribed.

Renewal of registration
As long as progress is satisfactory, renewal of the registration of a master's student will be accepted for the second year of the study. Registration for a third and subsequent years will only take place when the Student Administration of the Faculty receives a written motivation that is supported by the head of department and Postgraduate Studies Committee.

General
Candidates are required to familiarise themselves with the General Regulations regarding the maximum period of registration and the requirements on the submission of a draft article for publication.

Admission requirements

Candidates must be in possession of a BScHons degree or a degree with equivalent degree status (SAQA NQF 8). Final admission is subject to the approval of the Director of the Centre for Environmental Studies.

Additional requirements

Candidates must demonstrate proficiency in the English language up to the level required by either the TOEFL test (www.ets.org/toefl) or the IELTS language proficiency test (www.ielts.org).

Other programme-specific information

Note:
For the focus on Sustainable Development, final admission is subject to the approval of the Director of the Centre for Environmental Studies.

For the focus on Environmental Economics, students without a formal background in economics will be considered. Admission is subject to the approval of the Head of the Department of Agricultural Economics, Extension and Rural Development and the Director of the Centre for Environmental Studies. Additional courses in economics or related topics may be prescribed for students, depending on their academic background.

Promotion to next study year

The progress of all master's candidates is monitored biannually by the supervisor and the postgraduate coordinator. A candidate's study may be terminated if the progress is unsatisfactory or if the candidate is unable to finish his/her studies during the prescribed period.

Subject to exceptions approved by the dean, on recommendation of the head of department, and where applicable, a student may not enter for the master's examination in the same module more than twice.

Pass with distinction

The MSc degree is conferred with distinction to candidates who obtain a final average mark of at least 75% and a mark of at least 75% for the dissertation/mini-dissertation from each of the members of the examination panel. Where a member of the examination panel awards a mark of less than 75% for the dissertation/mini-dissertation, that member of the examination panel must offer, in writing, support for his/her decision, or indicate in writing that he/she supports the examination committee's decision to confer the degree with distinction.

Curriculum: Year 1

Minimum credits: 180

Core modules

Environment and development 811 (ENS 811)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

The foundation of the module is the interrelations between societal and environmental dynamics. It deals with issues of social structure, culture, politics, education, migration, production, urbanisation, demographics and social institutions and how these impact upon the environment. Also dealt with is how the consequences of impacts, such as environmental change, in turn affect societies. Analysis of complex interrelationships between society and the environment, social-environmental linkages and multiplier effects are dealt with.

Strategic environmental management 822 (ENS 822)

Module credits	15.00
Service modules	Faculty of Law
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

Strategic environmental planning: introduction, objectives and principles; levels; South African overview; guidelines: national and international; strategy and management; structure, strategy and agency; South African guidelines; diagnostic tools; RESP analysis; strategic resource planning; applications, implementation and control; development and policy implementation; South African environmental policy; evaluation frameworks; portfolio analysis; competitive forces; alliances; business benefits; intangibles, survival and catalytic contributions; South African legislation and regulations.

Environmental paradigms 810 (ENV 810)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	5 discussion classes per week
Language of tuition	English

Academic organisation	Zoology and Entomology
Period of presentation	Semester 1

Module content

Environmental philosophy and ethics, environmental ecology, environment, society and development, environmental economics, environmental management, critical resources management: water utilisation, air quality control, land-use planning: soil characteristics, biodiversity planning, critical resource management: determinism vs co-evolutionary environmental frameworks, research methodology and practice.

Research project 891 (ENV 891)

Module credits	90.00
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Zoology and Entomology
Period of presentation	Year

Module content

The student needs to conduct a research project under the supervision of an academic member of staff associated with the Centre for Environmental Studies. This project needs to be of a sufficient quality to be publishable in the open scientific literature. The research report is examined as a manuscript for a suitable journal.

Environmental law 816 (ENV 816)

Module credits	15.00
Service modules	Faculty of Law
Prerequisites	No prerequisites.
Contact time	2 practicals per week, 1 web-based period per week, 1 lecture per week
Language of tuition	English
Academic organisation	Zoology and Entomology
Period of presentation	Semester 1 or Semester 2

Module content

Legislation for sustainable development within the framework of international agreements, the different acts affecting water quality and water use, the SEMAs within the NEMA framework, the NEMA EIA regulations, legislation pertaining to hazardous substances, interaction between mining development and NEMA, energy law, strategic environmental legislation, marine and coastal management.

Elective modules

Boundary layer meteorology 811 (AQM 811)

Module credits	15.00

Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

Introduction to global circulation and South African weather and climate. Mathematical functions and atmospheric balance laws. Stability and mixing heights. The atmospheric boundary layer over urban and rural areas. Turbulence. Earth's energy budget. Transfer and exchange of energy. Introduction to atmospheric and chemical dispersion modelling. Practical modelling of air pollution: Box models, Gausian puff or plume models, stochastic models, trajectory models.

Atmospheric thermodynamics 813 (AQM 813)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

Gas laws. Virtual temperature. The hydrostatic and hypsometric equations. Dry adiabatic processes. The first law of thermodynamics. Latent heat. Stabilities and instabilities. Dry adiabatic temperature lapse rate. Potential temperature. Inversion layers. Atmospheric moisture and saturated-adiabatic processes. Vapour pressure. Saturation and condensation. Dew and frost point. Relative humidity. Saturated adiabatic temperature lapse rate. Cloud and rain formation. The second law of thermodynamics

Social modelling and assessment 824 (ENS 824)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

In this module students will be introduced to the various methods of modelling and assessing social impacts. Specific emphasis will be placed upon modelling societal-economic-environmental interactions, formulating stochastic and dynamic models of population-development-environment interactions, conducting research to determine possible impacts of environmental changes on communities and performing social impact surveys. Students will be introduced to both quantitative as well as qualitative methods of conducting social impacts assessments.

International environmental management systems 822 (ENV 822)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	20 lectures over a period of 1 week
Language of tuition	English
Academic organisation	Zoology and Entomology
Period of presentation	Semester 2

Module content

The ISO framework, environmental risks and opportunities for companies, global environmental concerns, environmental legislation, identification of environmental impacts, environmental certification and auditing, follow-up activities, the Forestry Stewardship Council framework, chain of custody requirements, production standards, FSC reporting.
(** additional costs involved for international UK certificate)

Environmental valuation and policy 826 (LEK 826)

Module credits	15.00
Service modules	Faculty of Economic and Management Sciences
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Agric Econ, Ext + Rural Dev
Period of presentation	Semester 2

Module content

Environmental valuation and policy. This module will review the basic principles of microeconomic theory needed for understanding and analysis of environmental problems, introduce market and non-market techniques of valuation of natural resources and environmental services (hedonic pricing, contingent valuation, transport cost, willingness-to-pay, cost-based techniques, etc.), public goods and environmental externalities, property rights regimes and selection of appropriate environmental policy instruments for management of environmental externalities.

Institutional economics 882 (LEK 882)

Module credits	15.00
Service modules	Faculty of Economic and Management Sciences
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Agric Econ, Ext + Rural Dev
Period of presentation	Semester 1

Module content

Institutional and behavioural economics. This module will expose students to the principles of the New Institutional Economics paradigm and how it can be utilized to improve the analysis of agricultural economic and agricultural development problems and issues. Major themes covered are: The agricultural development challenge: stylised features; new institutional economics: distinctive features and concepts; institutions and development: A historical and macro-perspective techno-economic characteristics and agricultural systems and products in poor countries; NIE analysis of markets and markets structures; the State: Political and institutional determinants of agricultural policy; collective action; transactions costs in smallholder agriculture; case studies.

Environmental change 881 (OMS 881)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	Both Afr and Eng
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

This module involves the study of the causes and consequences of environmental change from multidisciplinary perspectives. A focus of this course is human environmental interactions. Past processes leading to environmental change will also be discussed. In a given period, the following will be investigated: principles of environmental change, causes and consequences of environmental change, Global warming and climate change: causes and impacts of climate change on natural resources; water, forests, biodiversity, land use and land cover change, environmental/Climate change and infectious disease, human dimensions of global change and Climate change political responses including the Kyoto protocol. Mitigation and adaptation strategies to climate change and effects of Climate change on sustainable development.

Curriculum: Final year

Minimum credits: 180

Core modules

Environment and development 811 (ENS 811)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

The foundation of the module is the interrelations between societal and environmental dynamics. It deals with issues of social structure, culture, politics, education, migration, production, urbanisation, demographics and social institutions and how these impact upon the environment. Also dealt with is how the consequences of impacts, such as environmental change, in turn affect societies. Analysis of complex interrelationships between society and the environment, social-environmental linkages and multiplier effects are dealt with.

Strategic environmental management 822 (ENS 822)

Module credits	15.00
Service modules	Faculty of Law
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

Strategic environmental planning: introduction, objectives and principles; levels; South African overview; guidelines: national and international; strategy and management; structure, strategy and agency; South African guidelines; diagnostic tools; RESP analysis; strategic resource planning; applications, implementation and control; development and policy implementation; South African environmental policy; evaluation frameworks; portfolio analysis; competitive forces; alliances; business benefits; intangibles, survival and catalytic contributions; South African legislation and regulations.

Environmental paradigms 810 (ENV 810)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	5 discussion classes per week
Language of tuition	English

Academic organisation	Zoology and Entomology
Period of presentation	Semester 1

Module content

Environmental philosophy and ethics, environmental ecology, environment, society and development, environmental economics, environmental management, critical resources management: water utilisation, air quality control, land-use planning: soil characteristics, biodiversity planning, critical resource management: determinism vs co-evolutionary environmental frameworks, research methodology and practice.

Research project 891 (ENV 891)

Module credits	90.00
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Zoology and Entomology
Period of presentation	Year

Module content

The student needs to conduct a research project under the supervision of an academic member of staff associated with the Centre for Environmental Studies. This project needs to be of a sufficient quality to be publishable in the open scientific literature. The research report is examined as a manuscript for a suitable journal.

Environmental law 816 (ENV 816)

Module credits	15.00
Service modules	Faculty of Law
Prerequisites	No prerequisites.
Contact time	2 practicals per week, 1 web-based period per week, 1 lecture per week
Language of tuition	English
Academic organisation	Zoology and Entomology
Period of presentation	Semester 1 or Semester 2

Module content

Legislation for sustainable development within the framework of international agreements, the different acts affecting water quality and water use, the SEMAs within the NEMA framework, the NEMA EIA regulations, legislation pertaining to hazardous substances, interaction between mining development and NEMA, energy law, strategic environmental legislation, marine and coastal management.

Elective modules

Boundary layer meteorology 811 (AQM 811)

Module credits	15.00

Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

Introduction to global circulation and South African weather and climate. Mathematical functions and atmospheric balance laws. Stability and mixing heights. The atmospheric boundary layer over urban and rural areas. Turbulence. Earth's energy budget. Transfer and exchange of energy. Introduction to atmospheric and chemical dispersion modelling. Practical modelling of air pollution: Box models, Gausian puff or plume models, stochastic models, trajectory models.

Atmospheric thermodynamics 813 (AQM 813)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

Gas laws. Virtual temperature. The hydrostatic and hypsometric equations. Dry adiabatic processes. The first law of thermodynamics. Latent heat. Stabilities and instabilities. Dry adiabatic temperature lapse rate. Potential temperature. Inversion layers. Atmospheric moisture and saturated-adiabatic processes. Vapour pressure. Saturation and condensation. Dew and frost point. Relative humidity. Saturated adiabatic temperature lapse rate. Cloud and rain formation. The second law of thermodynamics

Social modelling and assessment 824 (ENS 824)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	English
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

In this module students will be introduced to the various methods of modelling and assessing social impacts. Specific emphasis will be placed upon modelling societal-economic-environmental interactions, formulating stochastic and dynamic models of population-development-environment interactions, conducting research to determine possible impacts of environmental changes on communities and performing social impact surveys. Students will be introduced to both quantitative as well as qualitative methods of conducting social impacts assessments.

International environmental management systems 822 (ENV 822)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	20 lectures over a period of 1 week
Language of tuition	English
Academic organisation	Zoology and Entomology
Period of presentation	Semester 2

Module content

The ISO framework, environmental risks and opportunities for companies, global environmental concerns, environmental legislation, identification of environmental impacts, environmental certification and auditing, follow-up activities, the Forestry Stewardship Council framework, chain of custody requirements, production standards, FSC reporting.
(** additional costs involved for international UK certificate)

Environmental valuation and policy 826 (LEK 826)

Module credits	15.00
Service modules	Faculty of Economic and Management Sciences
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Agric Econ, Ext + Rural Dev
Period of presentation	Semester 2

Module content

Environmental valuation and policy. This module will review the basic principles of microeconomic theory needed for understanding and analysis of environmental problems, introduce market and non-market techniques of valuation of natural resources and environmental services (hedonic pricing, contingent valuation, transport cost, willingness-to-pay, cost-based techniques, etc.), public goods and environmental externalities, property rights regimes and selection of appropriate environmental policy instruments for management of environmental externalities.

Institutional economics 882 (LEK 882)

Module credits	15.00
Service modules	Faculty of Economic and Management Sciences
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	English
Academic organisation	Agric Econ, Ext + Rural Dev
Period of presentation	Semester 1

Module content

Institutional and behavioural economics. This module will expose students to the principles of the New Institutional Economics paradigm and how it can be utilized to improve the analysis of agricultural economic and agricultural development problems and issues. Major themes covered are: The agricultural development challenge: stylised features; new institutional economics: distinctive features and concepts; institutions and development: A historical and macro-perspective techno-economic characteristics and agricultural systems and products in poor countries; NIE analysis of markets and markets structures; the State: Political and institutional determinants of agricultural policy; collective action; transactions costs in smallholder agriculture; case studies.

Environmental change 881 (OMS 881)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	Both Afr and Eng
Academic organisation	Geography, Geoinf + Meteor
Period of presentation	Year

Module content

This module involves the study of the causes and consequences of environmental change from multidisciplinary perspectives. A focus of this course is human environmental interactions. Past processes leading to environmental change will also be discussed. In a given period, the following will be investigated: principles of environmental change, causes and consequences of environmental change, Global warming and climate change: causes and impacts of climate change on natural resources; water, forests, biodiversity, land use and land cover change, environmental/Climate change and infectious disease, human dimensions of global change and Climate change political responses including the Kyoto protocol. Mitigation and adaptation strategies to climate change and effects of Climate change on sustainable development.

The information published here is subject to change and may be amended after the publication of this information. The General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the General Rules section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.