

# DIPLOMA IN ENVIRONMENTAL SCIENCES

## Qualification code: DPEV19 - NQF Level 6 (360 credits)

SAQA ID: 100981, CHE NUMBER: H16/14271/HEQSF

Campus where offered:

Arcadia Campus

### REMARKS

a. *Admission requirement(s) and selection criteria:*

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, [www.tut.ac.za](http://www.tut.ac.za).

• **APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

**Admission requirement(s):**

A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade or an E symbol at Higher Grade for English, Mathematics and Physical Science.

**Recommended subject(s):**

Biology and Geography.

**Selection criteria:**

Applicants who meet the minimum requirements will be invited to do an academic proficiency test. The applicants' performance in the Senior Certificate will contribute 80% to the final admission score and the academic proficiency test 20%. Applicants who pass the proficiency test will be shortlisted for selection by a departmental selection panel.

• **APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

**Admission requirement(s):**

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

**Recommended subject(s):**

Geography and Life Sciences.

**Selection criteria:**

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

**Assessment procedures:**

- Applicants with a score of 24 and more will be considered for admission.
- Applicants with a score of 21 to 23 will be invited to do an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test, will contribute 20%.

c. *Recognition of Prior Learning (RPL), equivalence and status:*  
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*  
January only.

- e. *Presentation:*  
Day classes.
- f. *Minimum duration:*  
Three years.
- g. *Exclusion and readmission:*  
See Chapter 2 of Students' Rules and Regulations.
- h. *WIL in Environmental Sciences I:*  
See Chapter 5 of Students' Rules and Regulations.

## CURRICULUM

### FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CAP105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
GCH105D	General Chemistry I	(5)	(24)	
GMA105D	General Mathematics I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LF1125X	Life Skills I (block module)	(5)	(2)	

### FIRST SEMESTER

AEP115D	Applied Environmental Practice I	(5)	(6)	
EVB115D	Environmental Biology I	(5)	(6)	

### SECOND SEMESTER

EVE115D	Environmental Earth Studies I	(5)	(6)	
EVM115D	Environmental Management I	(5)	(6)	

TOTAL CREDITS FOR THE FIRST YEAR: **120**

### SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
AEP206D	Applied Environmental Practice II	(6)	(20)	Applied Environmental Practice I
ELP206D	Environmental Legal Practice II	(6)	(20)	
EPS206D	Environmental Pollution Science II	(6)	(20)	General Chemistry I
EVB206D	Environmental Biology II	(6)	(20)	Environmental Biology I
EVE206D	Environmental Earth Studies II	(6)	(20)	Environmental Earth Studies I
EVM206D	Environmental Management II	(6)	(20)	Environmental Management I

TOTAL CREDITS FOR THE SECOND YEAR: **120**

### THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
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### FIRST SEMESTER

AEP316D	Applied Environmental Practice III	(6)	(15)	Applied Environmental Practice II
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EPS316D	Environmental Pollution Science III	(6)	(15)	Environmental Pollution Science II
EVB316D	Environmental Biology III	(6)	(15)	Environmental Biology II
EVM316D	Environmental Management III	(6)	(15)	Environmental Management II

## SECOND SEMESTER

On completion of all first- second- and third-year modules.

WES316D WIL in Environmental Sciences I (6) (60)

TOTAL CREDITS FOR THE THIRD YEAR: 120

TOTAL CREDITS FOR THE QUALIFICATION: 360

## MODULE INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change to accommodate industry changes. Please note that a more detailed syllabus is available at the Department or in the study guide that is applicable to a particular module. At time of publication, the syllabus content was defined as follows:

### A

**APPLIED ENVIRONMENTAL PRACTICE I (AEP115D) CONTINUOUS ASSESSMENT**  
*(Module custodian: Department of Environmental, Water and Earth Sciences)*  
 Essay writing. Site visit. Mapping and geographical positioning system. (Total tuition time: ± 60 hours)

**APPLIED ENVIRONMENTAL PRACTICE II (AEP206D) CONTINUOUS ASSESSMENT**  
*(Module custodian: Department of Environmental, Water and Earth Sciences)*

Scientific report writing. Learn to select appropriate tools and techniques in creating or editing graphics within a guided environment. Demonstrate detailed knowledge of and the ability to use the key terms, concepts, facts, principles, theories of how remote sensing works. Distinguish between possible areas of specialisation within the field of remote sensing and understand how remote sensing can be used in environmental monitoring and geographical information systems (GIS). Detailed knowledge and the ability to apply key terms, concepts, facts, principles, rules and theories in the field of geographical information systems and an understanding of how it is related to other closely related fields like geology, town planning, botany, hydrology and climatology. Evaluate a geospatial problem, select and apply appropriate geographic information system (GIS) methods, procedures and techniques to identify and apply geospatial analysis. Demonstrate the ability to identify, analyse and solve problems in unfamiliar contexts like a site visit to a greenfields or brownfields site where a development is proposed to occur, gathering relevant evidence of the current biotic and abiotic environmental conditions and applying baseline assessment procedures to make informed recommendations on how the development should be managed. (Total tuition time: ± 200 hours)

**APPLIED ENVIRONMENTAL PRACTICE III (AEP316D) CONTINUOUS ASSESSMENT**  
*(Module custodian: Department of Environmental, Water and Earth Sciences)*

Air dispersion modelling. Demonstrate detailed knowledge of Geographic Information Systems (GIS) and the ability to apply its key terms, concepts, facts, principles, rules and theories. Use Geographic Information Systems (GIS) for the investigation of environmental problems with a view to finding appropriate solutions to those problems. Identify, analyse and solve problems with new unfamiliar developments or projects, gathering evidence and applying solutions based on evidence and procedures appropriate to the field of Environmental Impact Assessment (EIA) or Strategic Environmental Assessment (SEA) in environmental science. Demonstrate the ability to evaluate different sources of information, to select information appropriate to the task of Strategic Environmental Assessment (SEA) or Environmental Impact Assessment (EIA) and to apply well-developed analysis, synthesis and evaluation of that information. (Total tuition time: ± 150 hours)



**C****COMMUNICATION FOR ACADEMIC PURPOSES (CAP105X)****1 X 3-HOUR PAPER****(Module custodian: Department of Applied Languages)**

A workable knowledge of English is an essential skill for any graduate who is required to conduct themselves successfully in a professional working environment. This module will equip students with the competencies required to compose a selection of written texts related to communicating both internally and externally within a professional environment. In addition, the module includes strategies that are essential for the effective communication in various situations, including small groups to avoid unproductive conflict, a multicultural context, etc. (Total tuition time: not available)

**COMPUTER LITERACY (CPL105X)****CONTINUOUS ASSESSMENT****(Module custodian: End User Computing Unit)**

Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. (Total tuition time: not available)

**E****ENVIRONMENTAL BIOLOGY I (EVB115D)****1 X 3-HOUR PAPER****(Module custodian: Department of Environmental, Water and Earth Sciences)**

Terrestrial and aquatic ecosystems. Functioning and importance of ecosystems. Threats to ecosystems. Biomes of South Africa. South Africa's flora. South Africa's fauna. (Total tuition time: ± 60 hours)

**ENVIRONMENTAL BIOLOGY II (EVB206D)****1 X 3-HOUR PAPER****(Module custodian: Department of Environmental, Water and Earth Sciences)**

Ecological principles. Organisms and the physical environment. Population ecology. Population's exploitation. Population's restoration and control. Community ecology. (Total tuition time: ± 200 hours)

**ENVIRONMENTAL BIOLOGY III (EVB316D)****1 X 3-HOUR PAPER****(Module custodian: Department of Environmental, Water and Earth Sciences)**

Population genetics. Conservation genetics. Local and regional phylogenetics. Evolution. (Total tuition time: ± 150 hours)

**ENVIRONMENTAL EARTH STUDIES I (EVE115D)****1 X 3-HOUR PAPER****(Module custodian: Department of Environmental, Water and Earth Sciences)**

Understand how the earth was formed. Know the solar system. Discuss the origin and function of the earth's magnetic field. Understand observations that led to the theory of plate tectonics. Discuss tectonic activities at different plate boundaries and how the impact on the different components of the environment i.e. hydrosphere, lithosphere, biosphere and atmosphere. Relate formation of sedimentary, igneous and metamorphic rocks to the different plate tectonics processes. Identify different minerals in hand specimen. Classify minerals on the basis of their chemistry. Relate chemistry of minerals to the impact they are likely to have on the environment. (Total tuition time: ± 60 hours)

**ENVIRONMENTAL EARTH STUDIES II (EVE206D)****1 X 3-HOUR PAPER****(Module custodian: Department of Environmental, Water and Earth Sciences)**

Understand how the Earth is layered and how these layers influence the resulting rock. Apply their knowledge of weathering and products in understanding the behaviour of metals in the environment. Determine and monitor the flow of groundwater. Determine the sources of groundwater contamination and put in place mitigation plans. Discuss tectonic activities at different plate boundaries and how the impact on the different components of the environment i.e. hydrosphere, lithosphere, biosphere and atmosphere. Relate formation of sedimentary, igneous and metamorphic rocks to the different plate tectonics processes. Identify different rock samples in hand specimen. Classify rocks on the basis of their mineral composition, fabrics and chemistry. Relate chemistry of minerals to their likely impact on the environment. (Total tuition time: ± 200 hours)

**ENVIRONMENTAL LEGAL PRACTICE II (ELP206D)****1 X 3-HOUR PAPER****(Module custodian: Department of Environmental, Water and Earth Sciences)**

Sources and branches of law. The Constitution of South Africa. Basic environmental legal principles in South Africa. Water law in South Africa. Biodiversity law in South Africa. Air pollution management law in South Africa. Laws for EIAs in South Africa. Waste law in South Africa. Law on Rehabilitation and Soils in South Africa. Law on Energy Creation and Use in South Africa. (Total tuition time: ± 200 hours)



**ENVIRONMENTAL MANAGEMENT I (EVM115D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Environmental, Water and Earth Sciences)**

Air pollution. Climate change. Water pollution. Renewable Energy. Human Population and Impacts on the environment. Sustainable cities. (Total tuition time: ± 60 hours)

**ENVIRONMENTAL MANAGEMENT II (EVM206D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Environmental, Water and Earth Sciences)**

Introduction to Integrated Environmental Management tools. Environmental economics. Voluntary and Mandatory screening. Environmental management systems. Sustainability Reporting. Environmental Auditing. (Total tuition time: ± 200 hours)

**ENVIRONMENTAL MANAGEMENT III (EVM316D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Environmental, Water and Earth Sciences)**

Define Integrated Environmental Management. Differentiate between Strategic Environmental Assessment and an Environmental Impact Assessment (EIA). Differentiate between a full EIA and Basic assessment process. Demonstrate an ability to compile a Basic Assessment using the provided template. Define Social Impact Assessment. Outline the SIA process and the legal mandate. Discuss the advantages of SIA. Describe the four stages of a Life Cycle Assessment. Discuss the benefits and limitations of LCA. Demonstrate knowledge of relevant terminology for Risk Assessment i.e. risk assessment, risk exposure, hazard. Describe the risk assessment process. Define relevant terminology, i.e. biocapacity, ecological footprint, ecological overshoot. Demonstrate knowledge of calculating ecological footprint. (Total tuition time: ± 150 hours)

**ENVIRONMENTAL POLLUTION SCIENCE II (EPS206D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Environmental, Water and Earth Sciences)**

Introduction to air, water and soil pollution. Potable water and wastewater treatment. Introduction to thermal pollution. Introduction to waste management. Introduction to emerging persistent pollutants (EPP). Experimental component: sampling inorganic trace metals from environmental media and determining their concentration. (Total tuition time: ± 150 hours)

**ENVIRONMENTAL POLLUTION SCIENCE III (EPS316D) 1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

**(Module custodian: Department of Environmental, Water and Earth Sciences)**

Advanced approaches to air, water, noise and soil pollution. Advanced approaches to wastewater treatment technologies. Advanced approaches to waste management. (Total tuition time: ± 150 hours)

**G**

**GENERAL CHEMISTRY I (GCH105D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Chemistry)**

The role and importance of chemistry in everyday life. Classification and properties of matter. Units of measurement. Atoms, molecules and ions. The modern view of atomic structure and the use of electron configurations in chemical bonding. The periodic table of elements. The use of IUPAC rules for naming inorganic compounds. Application of the mole concept in stoichiometric calculations. Reactions in aqueous solutions. Chemical equilibrium. Fundamental concepts in electrochemistry. Organic nomenclature. (Total tuition time: ± 240 hours)

**GENERAL MATHEMATICS I (GMA105D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Mathematics and Statistics)**

Do numerical computations. Apply knowledge of mensuration to calculate perimeters, areas and volumes of two- and three-dimensional objects. Apply knowledge of functions and equations to solve well-defined problems. Use basic calculus rules to solve well-defined problems. Use Excel to organise given data in charts and calculate descriptive measures. Do basic regression analysis and curve fitting using Excel and a scientific calculator; and Implement basic probability theories to predict outcomes of events. (Total tuition time: ± 120 hours)

**GENERAL PHYSICS I (GPH105D) 1 X 3-HOUR PAPER**

**(Module custodian: Department of Physics)**

Basic mathematical concepts for physics and measurements. Motion in one dimension. Motion in a plane (projectile motion). Forces and Newton's Law of Motion. Equilibrium condition and torque. Work, energy and power. Linear momentum and impulse. Properties of static and dynamic fluids. Temperature and heat. Heat transfer. General properties of waves. Reflection. Refraction. Electrostatics. Electric circuits. Basic nuclear physics. (Total tuition time: not available)



**I****INFORMATION LITERACY I (INI125D)****CONTINUOUS ASSESSMENT**

*(Module custodian: Directorate of Library and Information Services)*

Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. (Total tuition time: not available)

**L****LIFE SKILLS I (LFI125X)****CONTINUOUS ASSESSMENT**

*(Module custodian: Directorate of Student Development and Support)*

Academic, personal and socio-emotional skills development for students in higher education. Personal and social dimensions address: effective planning and self-management (goal setting and time management); Adjusting to university life (student life, diversity and change); Intra- and interpersonal skills development (conflict management, self-esteem, relationship management); Effective living (healthy living, HIV education, substance abuse); Academic dimension addresses: academic skills for university (e.g. critical thinking, creativity, managing assignments and assessments). (Total tuition time: not available)

**W****WIL IN ENVIRONMENTAL SCIENCES I (WES316D)****WORK-INTEGRATED LEARNING**

*(Module custodian: Department of Environmental, Water and Earth Sciences)*

Introduction to WIL (WDTL); WIL unpacked (purpose, outcomes, procedures-timeframe etc.) Roles and responsibilities (TUT staff, students, institutions). Action learning (Observation, problem-solving, action plans, Reflection practices). Development of applied competencies (PJBL and WBL): Producing and Communicating Information, specifically conducting stakeholder participation. Problem-solving. Collection of baseline environmental data and managing this data. Report writing such as is required for background information documents or basic assessment reports. Reflection. (Total tuition time: ± 600 hours)

