1. Programme Philosophy

As South Africa's economy grows towards that of an industrialised nation, environmental protection and preservation has become extremely important. The programme in Environmental Engineering and Technology at the University of Pretoria is formulated to provide human capacity for industry and raise awareness about the finite nature of the assimilative capacity of the environment. The programme at the Honours level provides the theoretical background in Environmental Technology and the mastery of the current regulatory framework. Broader open-ended problems are investigated at masters and doctoral level in order for our graduates to provide leadership and insight into solutions for emerging environmental problems. The new curriculum recognises the integrated nature of the environmental systems. Thus, the current course offerings integrate the four main focus areas in Water and Environmental Engineering, namely: Water Quality & Utilisation, Waste Management, and Air Pollution Control.

2. Course Offerings

The postgraduate programme of the Environmental Engineering Group (EEG) offers the following degrees: BEng(Hons) and MEng Environmental Engineering for students with a BEng or equivalent qualification, and the BSc(Hons)(App.Sci) and MSc(App.Sci) for students with an acceptable B-degrees from other science fields.

Masters degree studies through research are offered to students who have achieved an average of at least 60% for their Honours studies.

This leaflet is provided as a supplement to the official yearbook.

3. Programme outline

A candidate who enrols for the Honours degree must pass the following basic modules (128 credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEM 780</td>
<td>Environmental Management (32 credits)</td>
</tr>
<tr>
<td>CAM 780/787</td>
<td>Air Management (32 credits)</td>
</tr>
<tr>
<td>WQB 780/787</td>
<td>Water Quality Management (32 credits), and</td>
</tr>
<tr>
<td>WAI 780/787</td>
<td>Waste Management (32 credits)</td>
</tr>
</tbody>
</table>

For completion of a Masters degree; a candidate has to successfully complete the coursework component (Honours degree) comprising of the 4 basic modules (128 credits) and the dissertation research module (CVD 800/807) of 128 credits.

4. Module descriptions

**Environmental Management**

**CEM 780**

- Theme EM1: Environmental awareness.
- Theme EM2: South African environmental legislation.
- Theme EM3: Environmental management models, the Blue model, Responsible Care, USEPA.
- Theme EM4: Environmental standards, ISO 14001.
- Theme EM5: Environmental impact assessments.
- Theme EM6: Life cycle assessment and engineering.
- Theme EM9: Environmental economics.

**Air Management**

**CAM 780/787**

- Theme AM1: Air quality awareness, impacts of air pollutants and greenhouse gases.
- Theme AM2: South African air pollution legislation.
- Theme AM3: Meteorology and dispersion modelling.
- Theme AM4: Measurement of air pollution - sampling and analysis.
- Theme AM5: Equipment design of settling chambers and cyclones.
- Theme AM6: Venturis and other wet cleaning equipment.
**5. Enrolment**

**Admission:** All prospective postgraduate students must in the first instance obtain admission to the School of Engineering. Application forms are available at the Client Services Centre (CSC) or on the UP-web.

**Registration requirements:** Please refer to the Faculty of Engineering yearbook and the Post-graduate information on the website of the Water Utilisation Division in the Department of Chemical Engineering at the following website:

http://www.up.ac.za/chemeng

**Registration:** All students must register every year.

Registration will take place on Monday 26th January 2009 10:00 – 15:00, Building 2 South Campus.

**Other qualifications:** Students with qualifications from other South-African universities must take note of General Regulation G.62. Students with qualifications from foreign universities will be judged on merit.

**6. Course Fees & Financial Support**

Information on course fees should be obtained from student administration. Please contact:

Honours: Mrs Mofulatsi 012-420-2142
eunice.mofulatsi@up.ac.za

Masters and doctoral: Ms Steenberg 012-420-5315
stefanie.steenberg@up.ac.za

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**Waste Management**

Identify source materials, physical and chemical properties of waste; Release and transport mechanisms from source to air, groundwater, soil; Primary pathways of contaminants including sorption, volatilisation, biotic and abiotic transformations; Toxicology: absorption, distribution, biochemical transformation, and secretion of chemicals; Acute and chronic toxicity quantification and evaluation of risk; Hazard identification, exposure assessment, toxicity assessment, risk assessment and approaches to hazardous waste minimisation, treatment and disposal; The handling, classification and disposal of hazardous waste; Disposal of waste by landfill; Water monitoring at waste management facilities; Recycling and resource management; Waste prevention, minimisation and optimisation. **Handbook:** RJ Watts (1997) Hazardous Wastes: Sources, Pathways, Receptors.

- Module presented by Prof J Schoeman at (012) 420 3569 (e-mail japie.schoeman@up.ac.za).

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**Environmental Engineering and Technology: Post Graduate Programme 2009**

**Lecture room 2-4, Building 2, South Campus**

**SEMESTER 1**

<table>
<thead>
<tr>
<th>Block 1</th>
<th>Jan. 26</th>
<th>Orientation, registration, library session</th>
<th>10:00-15:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 2</td>
<td>CEM 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>Feb. 3</td>
<td>CEM 780</td>
<td>8:00-16:00</td>
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</tr>
<tr>
<td>Jan. 29</td>
<td>WQB 780</td>
<td>8:00-16:00</td>
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</tr>
<tr>
<td>Jan. 30</td>
<td>WQB 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>April 21</td>
<td>CEM 780</td>
<td>(Afternoon)</td>
<td>13:00-16:00</td>
</tr>
<tr>
<td>April 22</td>
<td>CEM 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>April 23</td>
<td>WQB 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>April 24</td>
<td>WQB 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>June 24</td>
<td>CEM 780</td>
<td>8:30-12:30</td>
<td></td>
</tr>
<tr>
<td>June 26</td>
<td>WQB 780</td>
<td>8:30-12:30</td>
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</table>

**SEMESTER 2**

<table>
<thead>
<tr>
<th>Block 3</th>
<th>July 21</th>
<th>CAM 780/7</th>
<th>8:00-16:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 22</td>
<td>CAM 780/7</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>July 16</td>
<td>WAI 780</td>
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<tr>
<td>July 17</td>
<td>WAI 780</td>
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</tr>
<tr>
<td>Block 4</td>
<td>Oct. 5</td>
<td>CAM 780/7</td>
<td>8:00-16:00</td>
</tr>
<tr>
<td>Oct. 6</td>
<td>CAM 780/7</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>Sept. 30</td>
<td>WAI 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>Oct. 1</td>
<td>WAI 780</td>
<td>8:00-16:00</td>
<td></td>
</tr>
<tr>
<td>Exam</td>
<td>Nov. 12</td>
<td>WAI 780</td>
<td>8:30-12:30</td>
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<tr>
<td>Nov. 16</td>
<td>CAM 780/7</td>
<td>8:30-12:30</td>
<td></td>
</tr>
</tbody>
</table>

Lectures start at 08:00 and examinations at 08:30.

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**7. Contact Information**

For more information about the Environmental Engineering and Technology Programme, please contact Prof Evans M.N. Chirwa at 082 359 8548, e-mail evans.chirwa@up.ac.za or visit the EEG website at: http://www.up.ac.za/chemeng

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**8. Relevant Dates for 2009**

The basic modules are presented during block lectures throughout the year. Each module consists of study themes and the following table presents the relevant venue, lecture and examination dates:

**Water Quality Management**

**WQB 780**

Water quality parameters: physical, chemical, biological, microbiological. Units of expression. Evaluation of parameters. Methods of analysis and practical laboratory analyses; Water quality interpretation, evaluation and assessment, water quality guidelines and requirements for domestic, industrial, agricultural, ecological, recreational requirements; Limnology and water quality in rivers and lakes; Surface water modelling; Ground water quality and assessment; Regulatory aspects including all relevant legislation; Integrated environmental management, integrated pollution control; Procedures to assess effluent discharge impacts; and Water quality management, policies and procedures, role of catchment management agencies, and catchment management plans.


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SA ACT National Environmental Management – Air Quality Act No 39 of 2004


SA ACT National Environmental Management – Air Quality Act No 39 of 2004