Course Information

1. **Course:**
   Water Quality Monitoring: Principles, Approaches and Techniques (CEM-06.4.3)

2. **Level of Presentation:**
   | Proposed NQF-Level | 6 |

3. **Entrance requirements:**
   A Grade 12 certificate as a minimum and preferably also:
   - Relevant tertiary education in at least one of the fields of environmental management;
   - basic knowledge of/and relevant experience in water quality management.
   - No formal prior learning is required, as this is an entry level course.

4. **Introduction:**
   Environmental Management is about making decisions on the timely implementation of appropriate technological options and socio-economic solutions aimed at reducing the hazards posed by our activities and protecting receiving environments against the consequences of our actions. The consequences of implementing management decisions for preventive and/or mitigatory measures based on incorrect, inadequate or unreliable monitoring information can be far-reaching, both financially and legally.

   A management decision is only as good as the information it is based on, and for environmental management such information is usually obtained by collecting data through the monitoring of environmental components and resources. Water quality monitoring includes the sampling, analysis, interpretation and presentation of data, all of which can be extremely costly.

   This course is essential for those who need to deal with water quality issues and/or to obtain water quality monitoring data, those who are required to understand the interpretation of this data into management information, and those who need to communicate the information to communities and decision-making bodies.

5. **Aim:**
   The course aims at enabling environmental managers to understand the principles and the practical approaches and techniques required to effectively monitor the chemical, hydrological, microbiological and aquatic elements of water quality. It is also aimed at assisting in the design and development of effective water quality monitoring programmes which take cognisance of the relevant legal, institutional, technical and practical issues.
The course will also enable the understanding of the translation of data obtained through such monitoring programmes into reliable management information.

6. **Course objectives and assessment criteria:**

After completion of the course, the delegate will demonstrate the following:

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<tr>
<th>NQF level descriptor</th>
<th>Course outcome</th>
<th>Assessment criteria</th>
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</table>
| **1. Scope of knowledge and knowledge literacy** | A detailed knowledge and understanding of -
- The key terminologies, concepts, principles, processes, legislation and other requirements related to water quality monitoring, and more specifically integrated water resource management planning in a South African context; and
- How knowledge of integrated water resource management, and more specifically, water quality, relate to applicable knowledge within the fields of environmental management. | Demonstrated ability to:
- Use and explain key terminologies, concepts, principles, processes, legislation and other requirements related to water quality management correctly;
- Analyse and interpret water quality data; and
- Indicate how integrated water quality management relates to environmental management in general. |
<p>| <strong>2. Method and procedure</strong> | The ability to correctly select, evaluate and apply requirements and best practices related to integrated water resource management, with recommended methodologies and approaches to effectively manage the quality of ground- and surface water; and The ability to select the correct methodologies and apply the relevant techniques for the sampling and analysis of water samples, and for the interpretation of water quality data. | Demonstrated ability to actively use and apply the instruments, registers, templates and methods provided to capture, analyse and interpret water quality monitoring data; |
| <strong>3. Problem solving</strong> | The ability to solve water management related issues in unfamiliar contexts to apply solutions to support efficient water management practices. | Demonstrated ability to, within an unfamiliar context solve the problem of developing Integrated Water Management Plans; and The ability to within unfamiliar contexts analyse and interpret water quality data, and to discuss the interactions between water quality data and the potential impacts and interactions. |</p>
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<td><strong>4. Ethics and professional practice</strong></td>
<td>An understanding of the ethical implications of decisions, actions and practices specifically relevant to water quality management, in accordance with the principles of sustainable development and best practices in the field of water management;</td>
<td>Demonstrated ability to formulate their own ethical perspectives on selected water-related environmental scenarios.</td>
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<td><strong>5. Accessing, processing and managing information</strong></td>
<td>The basic research skills, such as gathering and verifying information from various sources provided, analysing and summarising key aspects and using the information to implement recommended methodologies and approaches;</td>
<td>Demonstrated ability to utilise the resources provided to extract, analyse, summarise and/or apply the relevant information to solve the problems posed in the practical exercises.</td>
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<td><strong>6. Producing and communicating information</strong></td>
<td>The ability to develop and present accurate and coherent written and verbal information as a portfolio of evidence;</td>
<td>Demonstrated ability to effectively record and present diverse information generated as part of practical exercises in a written and verbal format.</td>
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<td><strong>7. Context and systems/processes</strong></td>
<td>The ability to understand how the learning material offered in this course relate to contexts, other systems and/or processes and the interactions between these, to make decisions and act appropriately in familiar and new contexts;</td>
<td>Demonstrated ability to indicate how integrated water management relates to environmental management in general and how water management decisions might impact on the environment.</td>
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<td><strong>8. Management of learning</strong></td>
<td>The ability to act as group member and/or a group leader to successfully complete the practical exercises and taking co-responsibility for learning progress and outcome realisation of the group; and</td>
<td>Demonstrated ability to actively participate in group work and contribute to successfully completing practical exercises.</td>
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<td><strong>9. Accountability</strong></td>
<td>The ability to monitor own learning progress, and apply relevant learning strategies and resources to successfully realise all outcomes of this course.</td>
<td>Demonstrated ability to achieve the learning objectives in an effective and expeditious manner.</td>
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**6.1 CEM Assessment Process:**

| Continous Assessment | ✓ | Structured Practical Work | ✓ | Peer Evaluation | ✓ | Examination | ✓ | Take-away Assignment | × |

**6.2 Attendance:**

A minimum attendance of 80% is required for the duration of the course.
6.3 **Continuous delegate assessment:**
Delegates are continuously assessed on a daily basis. Tutors award a daily assessment score, based on an evaluation of individual delegates presence, punctuality and achievement of the objectives of the course.

6.4 **Assessment of practical work:**
Participation in and the achievement of the objectives of the practical work are also assessed and a practical assessment score is awarded for syndicate group work.

Participation in and the achievement of the objectives of the practical work are assessed by both the presenters and when required also by delegates peers, and a practical assessment score is awarded for the syndicate group work.

Syndicate groups will submit a portfolio of evidence of the practical work done, either in hard copy form or as electronic files on a CD.

6.5 **Take-away assignment:**
Not applicable.

6.6 **Calculation of continuous assessment score:**
The practical assessment score and daily assessment score contribute to the continuous assessment score at a ratio of 60% (practical assessment score) to 40% (daily assessment score).

6.7 **Examination:**
A written, open book examination is scheduled.

Delegates require a continuous assessment score of at least 50% and course attendance of at least 80% to be allowed to sit for the examination.

6.7.1 **Documents to be used during the examination:**
Reference material that may be used during the examination is limited to the delegate’s file provided to the delegate during the course, the delegate loan file, notes made during the course, and additional documents listed:
- dictionaries

6.8 **Calculation of the Final Delegate Assessment Score (FDAS):**
The examination score and continuous assessment score contribute to the final delegate assessment score at a ratio of 60% (examination score) to 40% (continuous assessment score).

7. **Certificates:**
To be awarded a **certificate of successful completion**, delegates require:
- a final delegate assessment score of at least 60%; and
- an examination score of at least 50%; and
- course attendance of at least 80%; and
- to have made payment in full.
Delegates who do not qualify for a **certificate of successful completion** may be awarded a **letter of attendance** should all requirements be met. To be awarded a **letter of attendance** delegates require:

- a final delegate assessment score of at least 50%; and
- a sub-minimum Examination Score of at least 40%; and
- course attendance of at least 80%, and
- to have made payment in full.

Should the course fee be outstanding for twelve (12) months no certificate/letters of attendance will be awarded.

Should any typing errors have been made on certificates/letters of attendance, original certificates/letters of attendance must be returned to the CEM before replacements are issued.

7.1. **Re-examination:**

A delegate who qualified for a **letter of attendance** after the initial course may ask to be allowed to sit for a re-examination within six (6) months of the issuing of the results if a final delegate assessment score of at least 50%, an examination score of at least 40%, and attendance of at least 80% were achieved.

The following conditions apply:

- Delegates apply to the CEM in writing for any re-examination.
- A re-examination fee of R500-00 is payable in advance.
- Delegates will be allowed to sit for a re-examination in Potchefstroom on pre-scheduled dates and times that will be communicated in Addendum A to the results letter.

The continuous assessment score achieved during the first examination event shall be used when the final delegate assessment score is calculated following any re-examination. When a delegate decides to sit for a re-write, the re-write mark will be taken as a final score. The first examination mark will not be considered even if it was higher than the re-write mark.

8. **CEM pass norm:**

It is expected that at least 75% of the delegates attending this course should pass.

9. **Course results:**

In order to meet SAQA and North-West University quality assurance requirements, the CEM assessment process incorporates not only the grading of examination papers, but a further rigorous process involving moderation and the independent approval of all assessment results by an internal CEM assessment panel. As the panel meets only once a month, it will take approximately two (2) months before the final course results will be released.

The CEM is not at liberty to provide any course results to a third party (including the employer of the delegate) without the consent of the delegate.
Electronic results letters will be sent to all delegates shortly after the approval of the assessment results by the CEM assessment panel. The certificates/original letters of attendance will be posted shortly thereafter by registered post, or as soon as payment has been received.

10. **Complaints and appeals:**
Delegates may raise any complaint in writing or orally, both during the course and afterwards. Delegates are also given the opportunity to raise any issues of concern during the formal evaluation at the end of the course.

Delegates may lodge an appeal, should there be any grounds for an appeal, within ninety (90) days (3 months) of the issuing of the results. Contact Ms H Smit at Hettie.Smit@nwu.ac.za or +27 (0) 18 299-2723.

A fee of R250-00 applies, should an appeal result in the re-grading of an examination script.

11. **Unit standards:**
11.1 *Based on:*
None applicable

11.2 *Informed or aligned with:*
The following unit standards informed this course

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<th>U/S No.</th>
<th>U/S Title</th>
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<tr>
<td>116982</td>
<td>Demonstrate knowledge of water quality control</td>
<td>7</td>
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11.3 *Credits:*
Not offered

12. **Accreditation and registration of courses:**
The North-West University is a multi-purpose higher education provider accredited with the South African Qualifications Authority (SAQA). The Higher Education Quality Committee (HEQC) is the Education and Training Quality Assurance (ETQA) of this sector. As part of the quality assurance process of the HEQC, the North-West University also has an agreed-upon quality assurance process in place for formal qualifications and short courses. Due to this status (as an accredited multi-purpose higher education provider, quality assured by the HEQC) it is not possible or necessary for the University to register as a service provider with a specific Sector Education and Training Authority (SETA). All of the CEM short courses have been approved by and are registered with the Institutional Committee for Academic Planning and Standards of the North-West University and are managed in accordance with both the university’s requirements and the Higher Education Quality Committee (HEQC) requirements.
13. **Registration for Continued Professional Development (CPD):**

This course has been registered with the following professional bodies for CPD recognition:

- Health Professions Council of South Africa:
  - Course Group: *Specific Environmental Management Tools*  
    (Accreditation Number EHP001/08/03/2008)
- Engineering Council of South Africa.