# MODULE DESCRIPTION FORM

**CL969 Contaminated Land Management**

<table>
<thead>
<tr>
<th>Module Registrar: Dr C Switzer</th>
<th>Taught To (Course): Various MSc and MEng courses in the Department of Civil Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Lecturers Involved: Dr P Sentenac</td>
<td>Credit Weighting: 10</td>
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<tr>
<td>Assumed Prerequisites:</td>
<td>Semester: 1 &amp; 2</td>
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<tr>
<td>Compulsory/ optional/ elective class:</td>
<td>Academic Level: 5</td>
</tr>
</tbody>
</table>

### Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Assignments</th>
<th>Private Study</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>2</td>
<td>30</td>
<td>20</td>
<td>26</td>
<td>100</td>
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### Educational Aim

This module aims to provide insights into the remediation of contaminated land, including the regulatory framework and risk assessment, sampling & analysis, and the various remedial techniques for contaminated land.

### Learning Outcomes

On completion of the module the student is expected to be able to:

- **LO1** demonstrate a working knowledge of the regulatory framework in place in the UK for contaminated land management and remediation, including relevant legislation, policies and regulations.
- **LO2** identify possible human health and environmental risks associated with contaminated land management.
- **LO3** evaluate critically the range of technologies that may be suitable for various types of contamination present.
- **LO4** make informed decisions about technologies for contaminated land remediation based upon technical solutions, risk assessment & management, planning and financial constraints.

### Syllabus

The module will teach the following:

- Introduction to Land Regeneration – definitions, processes and relevant legislation.
- Overview of Site Investigation aims and methods.
- International differences in land regeneration.
- Planning advice and legislation in Scotland, the UK and the EU.
- Types of pollutants and contaminants (hydrocarbons, chlorinated solvents, metals). Hazards and risks.
- Site assessment, treatment selection and the related management implications.
- Links between Site Investigation, Risk Assessment and Remediation.
- Risk-informed decision-making.
- Land redevelopment: Residential, industrial/commercial and gardens/parks, risk assessment (source-pathways-receptor).
- Contaminated land management case studies.

### Assessment of Learning Outcomes

**Criteria**

LO1 demonstrate a working knowledge of the regulatory framework in place in the UK for contaminated land management and remediation, including relevant legislation, policies and regulations.

C1 identify the major parties involved in remediation decisions.

C2 determine the main mechanisms for triggering remediation decisions.

C3 place UK framework into an international context.
LO2 identify possible human health and environmental risks associated with contaminated land management
C1 understand the types of contamination that may be present at a site and their possible impacts
C2 identify the potential source-pathway-receptor linkages at a site
C3 use conceptual site models to show the potential linkages

LO3 evaluate critically the range of technologies that may be suitable for various types of contamination present
C1 determine possible technology choices based on site-specific parameters
C2 identify strengths and weaknesses of technology choices
C3 connect strengths and weaknesses to site conditions

LO4 make informed decisions about technologies for contaminated land remediation based upon technical solutions, risk assessment & management, planning and financial constraints
C1 identify all stakeholder groups that may be affected by site contamination and/or the remediation effort
C2 connect information learning objectives L01 – L03 and stakeholder needs to remediation decisions
C3 evaluate critically costing information provided in the literature

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/)

1. Marking criteria are outlined clearly in the assignment handout and multiple opportunities for questions are available, either in class or through electronic correspondence. Each marking sheet is taken directly from this handout. Feedback sheets address directly what constitutes “excellent” work.
2. Expectations in terms of time and effort are outlined clearly in the presentation of each assignment. Early assignments are small and not intended to require a lot of time. These expectations are communicated clearly in class. The project is expected to be a much greater time commitment. Weightings for each assignment underscore the time expectations.
3. Feedback sheets given to students provide high quality information to students that allow them to compare their work to the expectations for each assignment and reflect on improvements for future.
4. Opportunities are provided to students to close gaps between current and desired performance by the prompt return of marks and feedback on the small, early assignments.
5. Students work on small summative work with minimal total marks but regular feedback. A group project with a more significant weighting follows these smaller assignments and allows students the opportunity to apply what they have learned.
6. Project work encourages interaction between peer groups and with the instructor.
7. Tutorial questions are provided to support student self-assessment and reflection.
8. Small courseworks give students choices in sites to evaluate and management practices to implement. There is some flexibility in the format of the final submission.
9. Departmental policy is to carry out mid-term class assessments and provide feedback to students.
10. An interdisciplinary group project supports the development of learning communities by allowing students from different MSc courses the opportunity to interact with each other.
11. Frequent, regular and positively-worded feedback provides a positive and encouraging atmosphere for student learning. Self-motivation and mutual respect are essential in the group project. Procedures support individual and group accountability in the assessment of the project.
12. Anonymous midterm feedback surveys and interaction with students in small groups will be used to adapt teaching practices and resources accordingly.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>L/Outcomes</th>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tbody>
<tr>
<td>L01, L02, L04</td>
<td>1</td>
<td>2 hours</td>
<td>50%</td>
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Indicate which learning outcomes (L01, L02 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines:
Coursework 1 – S2 week 2, Coursework 2 – S2 week 7, Project – S2 week 11

Resit Assessment Procedures:
Resit examinations will follow the August diet. Resit courseworks and/or project are by arrangement.

PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of exam and/or coursework.

**Recommended Reading**

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<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Publisher/Year</th>
<th>ISBN</th>
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**Additional Student Feedback**

*(Please specify details of when additional feedback will be provided)*

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<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room No</th>
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Session:

Approved:

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<th>Course Director Signature:</th>
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Date of Last Modifications:

*(Updated November 2010)*
# MODULE TIMETABLE

## Module Code:
CL9XX

## Module Title:
Contaminated Land Management

### Brief Description of Assessment:
Assessment consists of two courseworks designed to return rapid feedback to students, a group project and an examination. The group project mixes PG disciplines with CL954 students so that students benefit from interacting with students in other programmes. Anonymous peer evaluation ensures accountability. The examination is comprehensive.

### Assessment Timing:-

Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

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<thead>
<tr>
<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
<th>WK5</th>
<th>WK6</th>
<th>WK7</th>
<th>WK8</th>
<th>WK9</th>
<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
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<td>CW1 briefing</td>
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<th>Semester Two</th>
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<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
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<th>WK9</th>
<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
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<td>Spring exam diet</td>
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