CLASS DESCRIPTION FORM  
EV921 Water and Environmental Management  

Class Registrar: Dr T K Beattie  
Taught To (Course): MSs courses in Dept of Civil & Environmental Engineering  
Other Lecturers Involved:  
Credit Weighting: 10  
Semester: 1  
Assumed Prerequisites: Optional  
Academic Level: 5  

Class 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>
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<tbody>
<tr>
<td>20</td>
<td>1</td>
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<td></td>
<td>25</td>
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Educational Aim  
This class aims to provide an insight into water quality, water quality objectives and pollution control strategy, and introduce the design and control of water and wastewater treatment processes.

Learning Outcomes  
On completion of the class the student is expected to be able to

LO1 Understand the properties of surface water and how alterations to these, e.g. due to pollution events, can have an impact on water quality, biodiversity and human health

LO2 Discuss the impact of legislation on surface water quality

LO3 Discuss collection and treatment of community wastewater

LO4 Discuss treatment and provision of drinking water

(UK SPEC suggests no more than 4 learning outcomes per class. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the course specifications.)

Syllabus  
The class will teach the following:

Physical and chemical characteristics of water and wastewater, including BOD, COD, alkalinity, hardness, colour, turbidity, Fe, trihalomethanes.  
Microbial quality of water and its measurement, water and disease transmission.  
Effects of principal pollutants on the water ecosystem.  
Marine, coastal, estuarine pollution issues and control, objectives in out-fall design, bathing beaches, shell fisheries.  
River pollution, oxygen sag curve.  
Pollution of lakes and reservoirs, eutrophication, thermal stratification.  
Review of sources of pollution control strategy on the basis of Environmental Quality Objective, Best Practical Environmental Option, Environmental Quality Standard.  
Demand for water and production of wastewater.  
Wastewater Treatment: Water characteristics and water quality.  
Overview of sewage works design, preliminary processes including screens and grit removal, sedimentation theory and the design of settling tanks, activated sludge design, sludge treatment and disposal.  
Water Treatment: Review of water types and water quality objectives, overview of water treatment works design, coagulation, flocculation, filtration.

Assessment of Learning Outcomes  
Criteria  
For each of the Class Learning Outcomes the following criteria will be used to make judgements on student learning:  

[Note: Criteria break the LO down into ‘teachable’ elements but do not become syllabus orientated i.e. no mention of CAD package names, components etc.]
LO1 Understand the properties of surface water and how alterations to these, e.g. due to pollution events, can have an impact on water quality, biodiversity and human health
C1 familiarity with physical, chemical and biological properties of surface waters, and the influence they have on water quality
C2 familiarity with major water pollutants and the effect they have on surface water quality

LO2 Discuss the impact of legislation on surface water quality
C1 familiarity with the influence and impact of various EU directives on national legislation and the provision of national water quality standards for wastewater, surface, bathing and drinking water
C2 have an understanding of pollution control strategies utilising water quality standards and objectives as defined by National/EU regulation

LO3 Discuss collection and treatment of community wastewater
C1 familiarity with wastewater collection systems
C2 have an awareness of wastewater treatment processes and the overall design of sewage works, including the design of settling tanks, activated sludge and sludge treatment

LO4 Discuss treatment and provision of drinking water
C1 familiarity with plant processing for provision of drinking water from raw sources through to delivery of drinking water to the consumer
C2 have an awareness of water treatment including water types, water quality objectives, the processes of coagulation and flocculation and the design of filtration systems

The standards set for each criterion per Class 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/)

Please state briefly how these are incorporated in this class.

Students are given simple and clear guidance on performance criteria by reference to the University Guidance on Marking for Undergraduate Courses http://www.strath.ac.uk/media/ps/cc/gmap/academicaffairs/policies/marking_for_UG_courses.pdf.

Marking criteria are also outlined clearly in the assignment handout and opportunities for clarification are available in class. Expectations in terms of time and effort are communicated via weightings for each assignment. A range of formative and summative assessment methods are used to provide feedback to students, including assignments, group and/or individual presentations. Feedback sheets provide information allowing students to compare their work to the expectations for each assignment and reflect on improvements for future work. Generic feedback is shared with the whole class, to complement individual feedback for each student. The generic feedback is particularly useful inasmuch as any common or recurring difficulties experienced by many in the class could suggest ways in which teaching and guidance could be improved. The individual feedback is directed at how each student can improve. Opportunities are provided to students to close gaps between current and desired performance by the prompt return of feedback on early formative assignments. Formative and summative assessments are aligned by giving students opportunities to gain practice on material that may formally be assessed. Students are given opportunities to engage in optional (research-led) assignments which only count if the contribution of this additional work adds to the student’s overall class mark. This encourages more able students to try to achieve higher overall marks by taking their learning to a more advanced level, while at the same time avoiding overly penalising overloaded and/or less-able students who may be overwhelmed by the additional workload.

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

<table>
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<tr>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tbody>
<tr>
<td>Number</td>
<td>Duration</td>
<td>Weighting</td>
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<td>1</td>
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LO1-LO4 LO1, LO2

Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines:
E51 Water quality assignment – Week 7
E52 River basin planning assignment – Week 11
E53 Water pollution group assignment – Week 12

Resit Assessment Procedures:
Material will be covered by a resit exam in August
PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the class. Students who fail the class at the first attempt will be re-examined during the August diet. This re-examination will consist of an exam or coursework at the registrar’s discretion.

Recommended Reading

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<thead>
<tr>
<th>Background reading</th>
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<tr>
<td>Ellis, KV; Warn, AE &amp; White, G. Surface Water Pollution &amp; its Control. MacMillan ISBN 0 333 427645.</td>
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Additional Student Feedback
(Please specify details of when additional feedback will be provided)

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

Approved:

Course Director Signature:

Date of Last Modifications: September 2013

(Updated November 2010)
**CLASS TIMETABLE**

**Class Code:** EV921

**Class Title:** Water and Environmental Management

**Brief Description of Assessment:**
- E51 Water quality assignment (10%) – review questions on material covered to date
- E52 River basin planning assignment (10%) – comparative essay on River Basin Management Planning
- E53 Water pollution group assignment (5%) – water pollution poster
- Examination (75%) – 1st Diet Exam in January where students are required to answer three out of five questions in a 2-hour examination

**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>
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<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
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<td>Assign. 3</td>
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