



## **Module Specification**

### **Engineering Hydrology**

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## Part 1: Information

**Module title:** Engineering Hydrology

**Module code:** UBGLXH-15-1

**Level:** Level 4

**For implementation from:** 2023-24

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Geography & Environmental Mgmt

**Partner institutions:** None

**Field:** Geography and Environmental Management

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** Not applicable

**Features:** Not applicable

**Educational aims:** This module will be delivered through a number of lecture sessions aimed at establishing the discipline context, key definitions/concepts, and also at establishing a framework for learning.

**Outline syllabus:** The hydrological cycle (precipitation, evaporation, interception, infiltration and soil moisture redistribution, groundwater, runoff).

Analysis and interpretation of each element of the hydrological cycle.

Streamflow analysis techniques (flow duration curves, flood frequency analysis, unit hydrographs).

Conceptual approaches to modelling (metric, parametric and mechanistic) and the modelling process (problem definition, model selection, data acquisition, parameter selection, calibration, sensitivity analysis).

Flooding and the estimation of floods in ungauged catchments (simple methods, evolution of approaches, FEH methods, greenfield runoff estimation).

Practical application of a model in engineering hydrology.

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** The e-learning resources have been developed which guide the learner's independent learning. Through this mechanism learners build upon the fundamental concepts covered in the lectures and start applying new understanding through the tasks and activities provided in the e-learning. Formative feedback is provided to the group at subsequent contact sessions. Scheduled learning also includes a number of practical and field work sessions aimed at skills development.

On average students will receive 3 hours of contact time per week. This will be in a range of formats, including lectures, tutorial or computer-based sessions, formative feedback sessions and support via e-mail. The amount of time spent on activities in this module is shown below:

Activity Hours

Contact time (lectures/feedback/practical sessions) 38

Assimilation and development of knowledge 82

Coursework preparation 30

Total study time 150

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Source, analyse and interpret meteorological and hydrological data.

**MO2** Provide estimates of design rainfall.

**MO3** Explain and quantify the processes involved in the hydrological cycle, particularly runoff generation and flooding.

**MO4** Analyse streamflow data to determine flow characteristics (flow duration curves, unit hydrographs).

**MO5** Perform flood frequency analysis on recorded flow data.

**MO6** Undertake flood estimation in ungauged catchments, including estimation of greenfield discharge.

**MO7** Use hydrological techniques to solve engineering problems.

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 112 hours

Face-to-face learning = 38 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/index.html) via the following link <https://uwe.rl.talis.com/index.html>

## **Part 4: Assessment**

**Assessment strategy:** Assessment Task 1 is an Examination. Learning outcomes 1 - 3.

This assessment will be assessed via a 2-hour exam. The emphasis of the exam will be on testing theory and understanding of processes.

Assessment Task 2 (Portfolio of Practical Work) carries a higher weighting (60%) and will focus on practical skills and technical report writing. Learning outcomes 1, and 4 - 7. This portfolio comprises a set of between 4 and 6 practical reports, based around weekly worksheets. These will be completed and handed in during the term and no more than a week after the relevant session, although the expectation is that the work is done in the practical session and could be handed in at the end of the session. The mark will be calculated on the basis of a selection of these submissions. The rationale for this is to keep the student engaged and submitting small, manageable pieces of work on a regular basis, and for which they will receive feedback. Formative feedback will be provided in subsequent sessions.

Assessment Task 3 is a Technical Report. Learning outcomes 1, and 4 - 7. The Technical report builds on the report writing and presentation skills developed in the other Assessment Tasks, but also tests students' ability to undertake fundamental hydrological analysis and contextualise this in relation to catchment scale processes.

**Assessment tasks:**

**Examination** (First Sit)

Description: 2 hour examination

Weighting: 40 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3

**Portfolio** (First Sit)

Description: Portfolio of practical work

Weighting: 18 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO6, MO7

**Report (First Sit)**

Description: Technical report (2500 words)

Weighting: 42 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO6, MO7

**Examination (Resit)**

Description: 2 hour examination

Weighting: 40 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3

**Portfolio (Resit)**

Description: Portfolio of practical work

Weighting: 18 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO6, MO7

**Report (Resit)**

Description: Technical report (2500 words)

Weighting: 42 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO6, MO7

**Part 5: Contributes towards**

This module contributes towards the following programmes of study: