

Liverpool John Moores University

Title: CIVIL ENGINEERING HYDROLOGY AND ENVIRONMENTAL SCIENCE
Status: Definitive
Code: **5503ICPDCE** (126997)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Alison Cotgrave	Y

Academic Level: FHEQ5
Credit Value: 20
Total Delivered Hours: 32
Total Learning Hours: 200
Private Study: 168

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	24
Practical	6

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	Portfolio – Lab Reports (equivalent to 1500 words)	30	
Exam	AS2	Examination	70	2

Aims

This unit enables learners to develop an understanding of the hydrological cycle and the importance of hydrological influences for civil engineering projects. Learners will also cover water supply, water treatment, and wastewater and apply hydrological design to civil engineering projects.

Learning Outcomes

After completing the module the student should be able to:

- 1 Identify the importance of hydrological influences for civil engineering projects and precipitation calculations.
- 2 Apply hydrological design to civil engineering projects.
- 3 Identify quality control methods for water supply and discharge & assess the environmental impact of water and wastewater.
- 4 Perform a laboratory experiment including the production of a risk assessment, and present and communicate appropriate findings.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Portfolio	4		
Examination	1	2	3

Outline Syllabus

Hydrological influences: hydrological cycle, surface water, groundwater, human influences, hydrological budget at the catchment scale, water balance calculations, reservoir storage requirements

Precipitation calculations: different methods of precipitation measurements, rain gauges, rain gauge network design criteria, recording of rain-fall data, missing value estimation

Quality control methods: infiltration, Horton's equation, phi index, SCS method, factors affecting infiltration and theories of evaporation (evapotranspiration and estimation). pan- evaporation, Penman's equation

Hydrological design: catchment characteristics (area, length, slope, runoff coefficients, land use and cover, stream flow)

Principles of hydrological design: surface runoff, measurement of runoff, catchment characteristics (area, length, slope, runoff coefficients)

Water collection and distribution: surface water collection, groundwater collection, water transmission systems, water distribution systems

Wastewater collection systems: collection of sewage and stormwater, sewer materials

Pollution: surface and groundwater pollution control, types and sources of pollution, effects of water pollution and control measures, solid and hazardous waste management, air pollution, noise control

Water treatment and standards: water treatment processes, environmental quality.

Water quality (concepts, need of water quality studies and standards, physical/chemical/biological characteristics of water, water related diseases).

Learning Activities

Students will be supported in their learning, to achieve the above learning outcomes,

in the following ways:

By a series of lectures and tutorials and through participation within practical sessions for problem solving.

Self-managed investigative study to analyse cases related to the industry.

In-class participation and case studies are key features of this module.

A recommended resource list - indicating key reading, internet support and physical learning assistance, is provided to help enable students to undertake self-directed study.

Notes

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