

Module Information

2022.01, Approved

Summary Information

Module Code	5504ICBTCE
Formal Module Title	Civil Engineering Hydrology and Environmental Science
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	15
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
International College of Business and Technology

Learning Methods

Learning Method Type	Hours
Lecture	45
Practical	9
Workshop	21

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
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APR-PAR	PAR	April	12 Weeks
JAN-PAR	PAR	January	12 Weeks
SEP_NS-PAR	PAR	September (Non-standard start date)	12 Weeks

Aims and Outcomes

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.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Identify the importance of hydrological influences for civil engineering projects.
MLO2	2	Produce precipitation calculations for civil engineering projects.
MLO3	3	Identify quality control methods for water supply and discharge.
MLO4	4	Apply hydrological design to civil engineering projects and identify water & wastewater treatment processes.
MLO5	5	Assess the environmental impact of water and wastewater and examine water quality parameters through laboratory experiments.

Module Content

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, streamflow). 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. pipeline and valves, hydraulics of pipelines, network of pipelines, valves, pumps and pumping installations. Wastewater collection systems: collection of sewage and stormwater, sewer materials, flow measurements in sewers, sewer installations and testing, hydraulics of sewer systems, quantities of wastewater flows, design of sewers, maintenance of pipes and equipment, urban runoff and combined sewer overflow management. 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). Water supply systems, assessment of water demand, sources of water.
Module Overview	
Additional Information	

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	Portfolio	30	0	MLO3, MLO5
Exam	Exam	70	2	MLO1, MLO2, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Karl Jones	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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