



Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Hydrology and Hydraulics
Unit ID:	ENGRG2106
Credit Points:	15.00
Prerequisite(s):	(ENGRG1002)
Co-requisite(s):	Nil
Exclusion(s):	(ENGIN2201)
ASCED:	030999

Description of the Unit:

The key objective of this unit is to understand fundamental hydrological and hydraulic theories and processes. This understanding will further help develop skills required to analyse and design water resource management, especially runoff, water balance and water conveyance. The unit places particular emphasis on the fundamental basis for the estimation of the flow in the catchment and flow hydraulics and estimating runoff for design of water structures including drainage systems.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	■	■	■	■	■	■
Intermediate	■	■	✓	■	■	■

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Advanced	■	■	■	■	■	■

Learning Outcomes:

Knowledge:

- K1.** Describe the various forms of energy that are relevant to the flow of fluid, concepts of hydrostatics and Reynolds number.
- K2.** Identify and apply equations available for the analysis of flow within both single and more complex pipeline systems; and open channels.
- K3.** Explain the various components of hydrology and drainage systems.

Skills:

- S1.** Solve problems related to fluid statics, Bernoulli's equation, energy equations and losses in pipes.
- S2.** Laboratory experiments to calculate friction losses and measure flows in hydraulic structures.
- S3.** Undertake rainfall and runoff estimation from rainfall and catchment data.
- S4.** Gain practical understanding of hydraulic gradient and application of Darcy's equation.
- S5.** Describe evaporation losses, water balance and estimation methods

Application of knowledge and skills:

- A1.** Apply the equations available for the analysis of flow in pipes and open channels for the solution of practical hydraulic problems.
- A2.** Apply the equations available for analysis and design of hydraulic structures and water balance for the solution of practical engineering problems.

Unit Content:

Topics may include:

- Pipeline and pumping systems, pipe networks; steady open channel flow; flow control and flow measurement;
- Design and analysis of hydraulic structures;
- Precipitation and its analysis; rainfall and runoff estimation; stormwater management and planning;
- Soil moisture and soil water movement; Groundwater; sediment characterisation and sediment transport;
- Flood plain management

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1 - S5, A1 - A2	An assignment based around the design of an appropriate hydraulic and/or hydrologic system.	Individual assessment including a report and/or presentation.	10 - 30%
K3, S4, A2	Laboratory exercises and/or presentations & assessments	Report/Presentation/Quiz/Test	20 - 30%
K1 - K3, S1 - S5, A1 - A2	An examination(s) on any or all of the unit material.	Examination	40 - 60%

Adopted Reference Style:

IEEE

Refer to the [library website](#) for more information

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