

# CIVL 3011 HYDRAULICS

**Credit Points** 10

**Legacy Code** 300765

**Coordinator** Kejun Dong ([https://directory.westernsydney.edu.au/search/name/Kejun Dong/](https://directory.westernsydney.edu.au/search/name/Kejun%20Dong/))

**Description** The unit covers the principles of open channel hydraulics, pipe hydraulics and culvert hydraulics. Specific topics in open channel hydraulics include uniform flow, resistance equations, specific energy principle, flow types, gradually varied flow and rapidly varied flow. The purpose is to enable design of efficient open channels to meet engineering requirements. In addition, principles of pipe and culvert hydraulics are introduced, enabling analysis and design of pipe networks and culverts.

**School** Eng, Design & Built Env

**Discipline** Water and Sanitary Engineering

**Student Contribution Band** HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 3 subject

**Pre-requisite(s)** CIVL 2003

**Equivalent Subjects** CIVL 2015 - Water Engineering CIVL 2014 - Water Engineering

**Assumed Knowledge**

Mathematical knowledge equivalent to the content within 200238 Mathematics for Engineers 2.

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. analyse existing channels using hydraulic principles
2. apply basic hydraulic principles to design open channels of different configurations
3. critically analyse existing small hydraulic structures
4. design appropriate hydraulic structures to control and measure flow through open channels
5. analyse and design pipe networks using pressurised flow principles
6. evaluate the adequacy of existing culverts
7. design appropriate culverts using culvert hydraulic principles

## Subject Content

Open channel hydraulics: Basic principles - continuity, momentum and energy principles

Open channel hydraulics: Channel design - use of uniform flow principles

Open channel hydraulics: Best hydraulic sections

Open channel hydraulics: Specific energy principle

Open channel hydraulics: Rapidly varied flow - hydraulic jump

Open channel hydraulics: Gradually varied flow - water surface profiles

Open channel hydraulics: Flow measurements - weirs, spillways, gates and flumes

Pipe hydraulics: Laminar and turbulent flow in pipes

Pipe hydraulics: Major and minor losses in pipes

Pipe hydraulics: Pipes in series

Pipe hydraulics: Pipes in parallel

Pipe hydraulics: Pipe network analysis

Pipe hydraulics: Turbomachinery - pumps and pump selection

Culvert hydraulics: Basic principles - gravity and pressurised flows

Culvert hydraulics: Culvert flow classification

Culvert hydraulics: Design of culverts

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/Group Task
Quiz	1/2 hour	20	N	Individual
Quiz	1-hr	10	N	Individual
Intra-session Exam	2 hours, closed book	35	N	Individual
Final Exam	2 hours, closed book	35	N	Individual

Teaching Periods

## Sydney City Campus - Term 1 Sydney City

**Day**

**Subject Contact** Ankit Agarwal ([https://directory.westernsydney.edu.au/search/name/Ankit Agarwal/](https://directory.westernsydney.edu.au/search/name/Ankit%20Agarwal/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=CIVL3011\\_22-SC1\\_SC\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=CIVL3011_22-SC1_SC_D#subjects))

## Spring

### Penrith (Kingswood)

**Day**

**Subject Contact** Kejun Dong ([https://directory.westernsydney.edu.au/search/name/Kejun Dong/](https://directory.westernsydney.edu.au/search/name/Kejun%20Dong/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=CIVL3011\\_22-SPR\\_KW\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=CIVL3011_22-SPR_KW_D#subjects))

### Parramatta - Victoria Rd

**Day**

**Subject Contact** Kejun Dong ([https://directory.westernsydney.edu.au/search/name/Kejun Dong/](https://directory.westernsydney.edu.au/search/name/Kejun%20Dong/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=CIVL3011\\_22-SPR\\_PS\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=CIVL3011_22-SPR_PS_D#subjects))

## Sydney City Campus - Term 3 Sydney City

**Day**

**Subject Contact** Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=CIVL3011\\_22-SC3\\_SC\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=CIVL3011_22-SC3_SC_D#subjects))