

CIVL6330: Hydrology

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description This course introduces students to hydrology and the hydraulics of open channels. Topics include analysis of precipitation, evaporation, infiltration and runoff. Hydrology, frequency and routing of floods. Yield analysis, climate and hydrologic mass balance. Open channel hydraulics including mass, energy and momentum equations. Characterization of steady flow, controls and channel design. Unsteady flow in channels. Content of this course is similar to CIVL4330.

Academic Progress Requirements Nil

Assumed Knowledge Content covered in courses CIVL2040 Engineering Probabilities and CIVL2060 Numerical Methods (previously CIVL2050); CIVL2310 Fluids Mechanics.

Contact Hours

Callaghan Laboratory
Face to Face On Campus
1 hour(s) per term for 1 term starting Week 5
Laboratory sessions will take place in weeks 8-10. The Course Coordinator will allocate students to one session within that period.

Lecture
Face to Face On Campus
4 hour(s) per week(s) for 13 week(s) starting Week 1

Tutorial
Face to Face On Campus
2 hour(s) per week(s) for 13 week(s) starting Week 1

Unit Weighting Workload 10
Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

CONTACTS

Course Coordinator **Callaghan**
A/Prof. In-Young Yeo
In-Young.Yeo@newcastle.edu.au
(02) 4921 6055
Consultation: To be advised on the course Canvas site

Teaching Staff A/Prof. Jose Rodriguez
Jose.Rodriguez@newcastle.edu.au
(02) 4921 6157

School Office **School of Engineering**
EAG02
EA Building
Callaghan
SENG-ADMIN@newcastle.edu.au
9.00am-5.00pm (Monday to Friday)

SYLLABUS

Course Content

1. Hydrologic cycle
2. Precipitation and intensity-frequency-duration analysis
3. Evapotranspiration
4. Infiltration
5. Runoff
6. Energy, mass and momentum equations in open channel hydraulics
7. Characterization of steady flow
8. Channel controls
9. Channel design
10. Flood frequency analysis
11. Unsteady flow
12. Reservoir routing
13. Rainfall runoff routing

Course Learning Outcomes **On successful completion of this course, students will be able to:**

1. Solve elementary hydrology and open channel problems encountered by engineers
2. Identify hydrology and open channel related problems
3. Conduct open channel experiments in a laboratory setting
4. Demonstrate report writing skills commensurate with master's level engineering students
5. Summarise and interpret the research literature and apply it to practical problems

Course Materials **Lecture Materials:**

- Lecture Materials available on Canvas

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

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Course Assessment Requirements:

- Assessment 3 - Laboratory Report: Pass requirement - Must pass this assessment item to pass the course.

Compulsory Placement and WHS Requirements:

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ASSESSMENTS

This course has 5 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Written assessments	2 weeks following nomination	Pair	14%	1, 2
2	Midterm Quiz	Week 7 or 8, to be advised	Individual	16%	1, 2
3	Laboratory Report*	Week 12	Individual	10%	1, 2, 3, 4
4	Formal Examination	Exam period	Individual	50%	1, 2
5	Research Project	Must be submitted by end of semester 1 exam period. To be arranged with course coordinator.	Individual	10%	1, 2, 5

* This assessment has a compulsory requirement.

Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Written assessments

Assessment Type Description

Written Assignment

Four assignments submitted in groups of two. Individual assignments will be posted on the Canvas site and are to be submitted within 2 weeks following their nomination. The assignments are aimed at assisting students becoming familiar with key aspects of theory and practical application.

Weighting

14%

Due Date

2 weeks following nomination

Submission Method

Online
Specific Location

Assessment Criteria

Return Method

In Class

Feedback Provided

Online - . Solutions to be posted on Canva

Opportunity to

Students WILL NOT be given the opportunity to reattempt this assessment.

Reattempt

Assessment 2 - Midterm Quiz

Assessment Type Description

Quiz

Midterm quiz during class time to test student knowledge of key concepts covered in student lectures and tutorials up to week 7.

Weighting

16%

Due Date

Week 7 or 8, to be advised

Submission Method

In Class

Assessment Criteria

To be provided with Announcement

Return Method

In Class

Feedback Provided

In Class -. To be provided during lectures and tutorials.

Opportunity to Reattempt Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Laboratory Report

Assessment Type Report
Description Laboratory experiments will be conducted in groups. Group members and laboratory session times will be displayed on the Canvas site. An individual technical report (conforming to the formatting requirements provided on the Canvas site) must be written for one of the labs and submitted for marking. The laboratory program is aimed at providing hands-on experience at running experiments, recording results and writing technical reports.

Weighting 10%
Compulsory Requirements Pass requirement - Must pass this assessment item to pass the course.

Due Date Week 12
Submission Method Online
Specific Location

Assessment Criteria
Return Method Specific Location
Feedback Provided Returned Work - .
Opportunity to Reattempt Students WILL be given the opportunity to reattempt this assessment.

Assessment 4 - Formal Examination

Assessment Type Formal Examination
Description The formal examination is two hours long, open book
Weighting 50%
Due Date Exam period
Submission Method
Assessment Criteria
Return Method Not Returned
Feedback Provided No Feedback -.
Opportunity to Reattempt Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 5 - Research Project

Assessment Type Written Assignment
Description Investigation of a hydrological problem requiring literature review and analysis and submission of a written report

Weighting 10%
Due Date Must be submitted by end of semester 1 exam period. To be arranged with course coordinator.

Submission Method Online
Assessment Criteria
Return Method Online
Feedback Provided Online -.
Opportunity to Reattempt Students WILL NOT be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Attendance

Attendance/participation will be recorded in the following components:

- Laboratory (Method of recording: Recorded by demonstrator)

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students at the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

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1. the assessment item is a major assessment item; or
 2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
 3. you are requesting a change of placement; or
 4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures> that support a safe and respectful environment at the University.

Graduate Profile Statements

This course builds students' capacity in the following University of Newcastle Bachelor of Engineering Graduate Profile Statements (based on 2011 Engineers Australia revised Stage 1 Competency Standards for Professional Engineers):

UON Att.	University of Newcastle Bachelor of Engineering Graduate Profile Statements/ Engineers Australia Stage 1 competency statements	Taught	Practised	Assessed	Skill Level (1-4)
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability				
12	3.2. Effective oral and written communication in professional and lay domains.				
13	3.3. Creative, innovative and pro-active demeanour.				
14	3.4. Professional use and management of information.				
15	3.5. Orderly management of self, and professional conduct.				
16	3.6. Effective team membership and team leadership.				
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	x	x	x	x
8	2.2. Fluent application of engineering techniques, tools and resources.	x	x	x	x
9	2.3. Application of systematic engineering synthesis and design processes.				
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.				
	Knowledge Base				
1	1.1. Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.				
2	1.2. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.				
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	x	x	x	x
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.				
5	1.5. Knowledge of contextual factors impacting the engineering discipline.				
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.				

This course outline was approved by the Head of School on the 16/02/2024. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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