

# CA3677: HYDRAULICS AND HYDROLOGY

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## Effective Term

Semester A 2025/26

## Part I Course Overview

### Course Title

Hydraulics and Hydrology

### Subject Code

CA - Civil and Architectural Engineering

### Course Number

3677

### Academic Unit

Architecture and Civil Engineering (CA)

### College/School

College of Engineering (EG)

### Course Duration

One Semester

### Credit Units

3

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

CA2675 Fluid Mechanics

Students must have attempted (including class attendance, coursework submission, and examination) the precursor course(s) so identified.

### Equivalent Courses

BC3677 Hydraulics and Hydrology

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

To teach the student the theories and detailed calculations of fluid machinery, open channel flows and engineering hydrology.

### Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe and identify the appropriate application of fluid principles to hydraulic machineries and pipe systems	25	x	x	
2	Describe and identify the appropriate formulas for evaluating the principles of open channel flows and solve various open channel problems	25		x	
3	Discover the importance of engineering hydrology	25	x	x	
4	Understand and identify the appropriate formulas for carrying out mass curves and rainfall analysis and hydrological design	25			x

#### A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

#### A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

#### A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

### Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will engage in lectures to gain the knowledge about the theories, concepts and problem solving skills	1, 2, 3, 4	
2	Tutorials	Students will engage in tutorials to extend their use of knowledge during discussions on tutorial questions	1, 2, 3, 4	

### Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Test	1, 2, 3, 4	20		No
2	Lab reports	1, 2, 3, 4	10		No
3	Assignments	1, 2, 3, 4	20		No

**Continuous Assessment (%)**

50

**Examination (%)**

50

**Examination Duration (Hours)**

3

**Minimum Continuous Assessment Passing Requirement (%)**

30

**Minimum Examination Passing Requirement (%)**

30

**Additional Information for ATs**

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%.

**Assessment Rubrics (AR)****Assessment Task**

Test

**Criterion**

1.1 CAPACITY for SELF-DIRECTED LEARNING to understand the principles of hydraulics and hydrology

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal level

**Assessment Task**

Lab report

**Criterion**

2.1 ABILITY to USE/APPLY the methodology and procedure with ACCURACY in using the experimental techniques

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Assignment

**Criterion**

3.1 CAPACITY for SELF-DIRECTED LEARNING to understand the principles of hydraulics and hydrology

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Examination

**Criterion**

4.1 ABILITY to UNDERSTAND the taught methodology and procedures in using the modelling and calculation techniques

4.2 ABILITY to APPLY the scientific techniques in solving theoretical and application problems

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

**Part III Other Information****Keyword Syllabus**

Hydraulic machinery, open channel flow, Manning's equation, critical flow, hydraulic jump, engineering hydrology, mass curves and rainfall analysis and hydrological design.

**Reading List****Compulsory Readings**

Title	
1	Nil

**Additional Readings**

Title	
1	Yunus A. Cengel and John M. Cimbala, Fluid Mechanics Fundamentals and Applications, 2nd edition, McGraw Hill Higher Education, New York, 2010. ISBN: 978-007-128421-9.
2	Terry W. Sturm, Open Channel Flow, 2nd edition, McGraw Hill Higher Education, New York, 2010. ISBN: 978-007-126793-9
3	John E Gribbin, Introduction to Hydraulics and Hydrology: With Applications for Stormwater Management, ISBN-13: 9780766827943.
4	Gupta, Ram S., Hydrology and Hydraulic Systems, Prospect Heights, Waveland press, 2nd Edition.
5	Warren Viessman, Jr. and Gary L. Lewis, Introduction to Hydrology, Upper Saddle River, NJ, Prentice Hall, 5th Edition.