

CA3677: HYDRAULICS AND HYDROLOGY

Effective Term

Semester A 2022/23

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 introduce to the student the fundamentals 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	Discover the application of fluid principles to hydraulic machineries and pipe systems	25	x	x	
2	Explore the principles of open channel flows and solve various open channel problems	25		x	
3	Discover the fundamentals of engineering hydrology	25	x	x	
4	Carry 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.

Teaching and Learning Activities (TLAs)

TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Introducing theory, concepts and problem solving	1, 2, 3, 4
2	Tutorials	Putting theory and concepts into practice	1, 2, 3, 4

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Laboratory Reports	1, 2, 3, 4	5
2	Test and/or assignments	1, 2, 3, 4	45

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

3

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

Laboratory Reports

Criterion

1.1 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

Assessment Task

Test and/or assignments

Criterion

2.1 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

Assessment Task

Examination

Criterion

- 3.1 ABILITY to UNDERSTAND the taught methodology and procedures in using the modelling and calculation techniques
 3.2 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.