

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
CIVL 317 – FLUID MECHANICS LAB**

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Canino School of Engineering Technology

Department: Civil and Construction Technologies

Semester/Year: Fall 2021

A. **TITLE:** Fluid Mechanics Lab

B. **COURSE NUMBER:** CIVL 317

C. **CREDIT HOURS:** 1 credit hour(s) per week for 15 weeks

- One hour (50 minutes) of lecture per week
- Two to three hours of lab or clinical per week 2 hr lab
- Two hours of recitation per week
- 40 hours of internship

D. **WRITING INTENSIVE COURSE:** Yes No

E. **GER CATEGORY:** None: Yes: GER
If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED:** Fall Spring Fall & Spring

G. **COURSE DESCRIPTION:**

This laboratory course will provide experiential supplements to the Fluid Mechanics I lecture ENG 315; and experiential and computational activities which will demonstrate and investigate practical applications of fluid mechanics theories in the Civil Engineering realm.

H. **PRE-REQUISITES:** None Yes If yes, list below:

ENGS 315 Fluid Mechanics I

CO-REQUISITES: None Yes If yes, list below:

ENGS 315 Fluid Mechanics I

I. STUDENT LEARNING OUTCOMES: (see key below)

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> [SLO]	<u>Program Student Learning Outcome</u> [PSLO]	<u>GER</u> [If Applicable]	<u>ISLO & SUBSETS</u>	
Solve for resultant force and center of pressure on a submerged surface	2488 - SO 1, SO4 517 - SO 1, SO4		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Employ Bernoulli Energy Equation to solve for head, pressure or velocity for various fluid systems	2488 - SO 1, SO4 517 - SO 1, SO4		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Determine the head loss due to friction in a piping system	2488 - SO 1, SO4 517 - SO 1 SO4		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Compute the velocity and discharge in piping system systems	2488 - SO 1 517 - SO 1		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Compute the coefficient of discharge for flow devices such as venturi, weir and orifice.	2488 - SO1, SO4 517 - SO1, SO4		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Calculate discharge in open channels.	2488 - SO1, SO4 517 - SO1, SO4		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets

Design small sanitary or storm sewer system.	2488 - SO2 517 - SO2		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Prepare a standard report.	2488 - SO3 517 - SO3		1-Comm Skills ISLO ISLO	W Subsets Subsets Subsets
Function effectively as a team member.	2488 - SO 5 517 - SO 5		4-Soc Respons ISLO ISLO	T Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes No

If YES, select one or more of the following categories:

- Classroom/Lab
- Internship
- Clinical Placement
- Practicum
- Service Learning
- Community Service

- Civic Engagement
- Creative Works/Senior Project
- Research
- Entrepreneurship
(program, class, project)

K. TEXTS:

CIVL 317 Laboratory Manual, SUNY Canton

L. REFERENCES:

The text used in ENGS 315 will serve as reference.

Gribbin, J. E. (2007). Introduction to Hydraulics and Hydrology, 3rd Edition. Clifton Park, NY: Thomson Delmar Learning. ISBN: 1418032956.

M. EQUIPMENT: None **Needed: flow meters, weir, venturi meter, Bernoulli's Theorem apparatus, orifice and mouthpiece apparatus, reynolds apparatus, and other flow related equipment, computer lab with hydraulic related software (e.g. civil 3D hydraflow hydrograph, ArcGIS Hydrogeology toolset)**

N. GRADING METHOD: A - F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Computational Assignments, Lab Reports, Quizzes.

P. DETAILED COURSE OUTLINE:

N/A Lab course

Q. LABORATORY OUTLINE: None Yes

Lab	Topic (Order may vary)
1	Specific weight and density of water
2	Buoyancy
3	Piezometers and manometers
4	Resultant force from pressure on a vertical surface
5	Resultant force from pressure on an inclined surface
6	Friction/head loss in a pipe
7	Calibration of a venturi meter
8	Calibration of sharp crested weirs
9	Pump Selection
10	Toricelli's Theorem
11	Pipe system design
12	Computer Assisted Hydraulic Design (StormCad or Civil 3D)
13	Flow measurement in a natural stream
14	Operation of Hydraulic Devices