UNIVERSITY OF THE FRASER VALLEY

OFFICIAL COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE:	September 1995
COURSE REVISED IMPLEMENTATION DATE:	May 2010
COURSE TO BE REVIEWED:	February 2013
(four years after UPAC approval)	*(month, year)*

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

PHYS 325	Science/Physics	3
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UCFV CREDITS

Fluid Mechanics

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

Fluid mechanics is an important and yet often under-appreciated and neglected aspect of physics; yet an understanding of how fluids behave is important in a diversity of subjects from Astrophysics (stars and planetary bodies) to Microbiology (fluid flow into and out of cells). This course will introduce students to the subject of fluid mechanics from the basic principles of Archimedes and Bernoulli, to the more complex aspects of vortices and streamlines. An emphasis will be placed on the vector description of fluid behaviour, which will necessitate a brief introduction to Cartesian tensors.

PREREQUISITES: PHYS 221

COREQUISITES:
PRE or COREQUISITES: PHYS 222 or MATH 312 (PHYS 231 suggested)

SYNONYMOUS COURSE(S):
(a) Replaces:
(b) Cross-listed with:
(c) Cannot take: for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: **75**

STRUCTURE OF HOURS:

Lectures:	**75**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

OTHER:
Maximum enrolment: **24**
Expected frequency of course offerings: Every 2 – 3 years
(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s):	Jeff Chizma		
Department Head:	Norm Taylor	Date approved:	**Dec. 2, 2008**
Supporting area consultation (UPACA1)		Date of meeting:	**Dec. 19, 2008**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**Feb. 6, 2009**
Dean/Associate VP:	**Dan Ryan**	Date approved:	**February 11, 2009**
Undergraduate Program Advisory Committee (UPAC) approval		Date of meeting:	**February 27, 2009**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:
Demonstrate proficiency in analyzing problems involving fluid statics (Archimedes principle, gauge and absolute pressure)
Demonstrate a basic understanding of the dynamics of vortices, and apply this knowledge to simple situations involving moving fluids
Describe and explain the basic principles behind simple fluid flow (Bernoulli)
Identify the conservation laws at work during the flow of simple fluids
Explain the major differences between viscous and non-viscous flow

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

This course will be taught using lectures, demonstrations and accompanying software. Problems will be assigned and marked on regular basis.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☒ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☐ Other (specify):

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Fluid Mechanics, 4th Edition: Kundu & Cohen, Academic press (2008)
Introduction to Fluid Mechanics, 6th Edition; Fox, McDonald & Pritchard Wiley (2004)
Fluid Mechanics 2nd Edition, Vol.6 of course of Theoretical Physics, Landau & Lifshitz, Elsevier (1987)

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Assignments	30%
Midterm Examinations	20%
Final Examinations	40%
Project/Presentation	10%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

Week	Topic
1	Introduction
2	Fundamental Concepts
3-4	Fluid Statics
5-6	Cartesian Tensors and Vector Calculus Review
7-8	Fluid Kinematics
9-10	Conservation Laws
11-12	Vorticity Dynamics
12-13	Laminar Flow