**PHYS 325**  
**Science/Physics**  
**3**  

**COURSE NAME/NUMBER**  
**FACULTY/DEPARTMENT**  
**UCFV CREDITS**  

<table>
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<tr>
<th><strong>Course Descriptive Title</strong></th>
<th><strong>Fluid Mechanics</strong></th>
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**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.

Note: Effective May 2010, the prerequisite/corequisites to PHYS 325 will change: Prerequisite will be PHYS 221; the prerequisite/corequisite requirements will be PHYS 222 or MATH 312 (PHYS 231 suggested).

**Prerequisites:** PHYS 231; MATH 211 and MATH 212  
(NB: Effective May 2010, prerequisite will be changed to PHYS 221. The current prerequisites PHYS 231, MATH 211 and 212 will be removed)

**Corequisites:**  
PRE or COREQUISITES: NB: Effective May 2010, pre/corequisites required will be: PHYS 222 or MATH 312 (PHYS 231 suggested)

**Synonymous Course(s):**

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

**Total Hours per Term: 75**

**Structure of Hours:**

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<tr>
<td>Lectures:</td>
<td>75 Hrs</td>
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<tr>
<td>Seminar:</td>
<td></td>
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<tr>
<td>Laboratory:</td>
<td></td>
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<tr>
<td>Field experience:</td>
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<td>Student directed learning:</td>
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<td>Other (specify):</td>
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**Training Day-based Instruction:**

Length of course:  
Hours per day:  

**Other:**

Maximum enrollment: 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  
- [x] No

**Will Transfer Credit Be Requested? (Upper-level Requested by Department):**

- [ ] Yes  
- [x] No

**Transfer Credit Exists in BCCAT Transfer Guide:**

- [ ] Yes  
- [x] No
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)

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:]


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

Course designer(s): Jeff Chizma
Department Head: Norm Taylor
Supporting area consultation (UPACA1): Date approved: Dec. 2, 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