The mission of Concord University is to provide quality, liberal arts based education, to foster scholarly and creative activities and to serve the regional community (http://www.concord.edu/academics/).

Physics 320 – Special Topics: Fluid Dynamics – Spring 2019

Course CRN #20277 – Section 01

Semester Taught (including year):	**Spring 2019**	**Professor:**	**Dr. Aaron Paget**
Credit Hours:	**3 Credit Hours**	**Office Location:**	**S402C**
Prerequisites:	**Phys 102 or 202**	**Office Hours:**	**T/TH 9:30a - 12:00p**
Course Time (if applicable):	**MWF 10:00 AM – 10:50 AM**	**Email:**	**apaget@concord.edu**
Building and Room Number:	**S400**	**Phone:**	**304-384-6006**
		Office Fax:	**304-384-6022**

College/Department Websites
Department: Department of Physical Sciences (https://www.concord.edu/physci/node/1)
College: College of Natural Sciences, Mathematics, and Health (https://www.concord.edu/nsmh/)

Course Description/Rationale: Special Topics course focused on dynamics of fluids on various time scales including air, water, blood, magma, and other geologic fluids.

Course Management System: Moodle. The CU Moodle LMS and Administrators follow industry recommendations to keep your personal information private.
https://moodle.org/mod/page/view.php?id=8148
Moodle is the online Learning Management System (LMS) this course uses for homework submission and for communication in the case of a campus closure. Log into the course using your CU mycu username and password on the moodle website provided above. Contact your instructor if you have difficulty accessing the moodle portion of the class.

Hardware/Software Needed: Computer with internet access, MS Office Suite, PDF viewer, Flash Drive.

Text requirements:
1. Textbook: A PDF version of the textbook will be distributed by the professor.
2. A standard scientific calculator (Ex. TI-30, Graphing calculators are fine, no cell phones, tablets, or computers!)

Concord University Educational Goal(s)
Knowledge: Familiarity with principles underlying academic discourse in various fields, as demonstrated by the following capabilities:
2. An awareness of the fundamental characteristics and properties of the physical universe.

National Standards: This course includes many components that align with recommendations from the Physics Education Research (PER) community.

Specific Learning Outcomes: By the end of the course, successful students will
1) Identify the process by which fluids flow using concepts from classical physics.
2) Demonstrate a mastery of the basic concepts in fluid dynamics by explaining relevant conceptual applications when presented with a new physical system or scenario.
3) Demonstrate a mastery of identifying characteristics of fluid flows in the real world.

Course Requirements
Students are expected to prepare for each class by completing assigned readings before class, completing assignments including homework and quizzes, and being ready to focus on the material in the classroom. Coursework will include 2 exams (including final), homework, in-class quizzes, exam corrections, and a final project with oral and written presentation. You are expected to participate in each class period.

Fluid Dynamics is a challenging subject for most students because it requires the existence or development of mature academic discipline, an understanding of how to apply simple scientific models to complex, every day occurrences, and requires us to think in new ways. Your mastery of the material presented, and thus success in the class, will depend on your regular preparation for class, your regular participation in class, and the amount of problem solving practice you use during the semester.

Good preparation for class includes briefly reading the assigned textbook material on each topic and completing the paragraph summary prior to the discussion of that topic in class, reviewing previous lecture notes and text readings, working the assigned homework problems on the previous lecture's material, and seeking answers to questions you may have.

Class periods will be used to present the material listed on the course schedule through lecture, demonstrations, and interactive question and answer exercises. Interactive exercises in a variety of formats will be given in class to supplement the lecture and are based on the lecture and the assigned readings. You will use your notes, the textbooks, and a standard scientific calculator for most of these exercises. Thus, you are encouraged to bring all three to the lecture period.

Class will be held or cancelled according to campus schedules and policy, including CU's Inclement Weather Policy. If there is need for further clarification, someone from the Division of Science, Mathematics, and Health will make an announcement in the classroom.

You are responsible for all the material on the course schedule, whether or not it is mentioned in class. Any changes to the class schedule, homework, and syllabus will be announced in class. You are responsible for being aware of any announcements made in class even if you did not attend. Any changes to the class schedule or homework assignments as a result of a cancelled class will also be sent to the class via email or posted on moodle. Students are expected to check for this email and on moodle, and complete the assignments prior to the next class meeting. Any additional required changes will be

announced in class the next class meeting. As always, use your own good judgment in matters concerning your own safety.

Courteous behavior as outlined in the CU Student Handbook is expected in the classroom. This also includes, but is not limited to, having all necessary supplies with you in class, arriving on time, staying the full time, participating in the activities of the class, and notifying your instructor prior to a class meeting if you must be absent. If you have a personal emergency that requires you to leave during class, please do so as discretely as possible. Computers, tablets, phones, and other electronic devices can be a great resource for your education, but you will be invited to put them away if they appear to be a distraction to you or others. Any student disrupting class will be asked and expected to remove themselves from the classroom. Disruptions during tests, including those from electronic devices such as cell phones, or the electronic recording of the class in any form without my prior permission will result in a grade of F assigned for the course.

Grading Policy and Scale, Make-up Policy, Late Work
Grades will be assigned at the end of the semester and are calculated using the following weighting:
Summary Topic Presentation (10%)
Class participation (10%)
Homework (10%)
Exam 1 (20%)
Exam corrections (5%)
Course Project (20%)
Final Exam (25%)

I anticipate the letter grade break down to be A (100% - 90%), B (89.9% - 80%), C (79.9% - 70%), D (69.9% - 60%), F (Below 60%). The ranges for the grades may be adjusted only at the end of the semester to meet university grading criteria. As for changes in the grading scale, adjustments will be considered at the end of the semester when assigning final grades. No such grade adjustments will be made prior to the end of the semester. No individual opportunities to improve grades will be considered.

Course Timeline (Schedule of Assignments/Assessments/Presentations)

Unit 1:	14 January 2019 – 22 February 2019
Exam 1:	27 February 2019
Unit 2:	29 February 2019 – 26 April 2019
Unit 3:	29 April 2019 – 3 May 2019
Final Exam:	10 May 2019 at 9:00 am

Topics:

Unit 1:	Hydrostatics, Density, Bernoulli, Rossby Number, Cardiovascular System, Vorticity, Compressibility, Shallow Water Theory, Exam 1
Unit 2:	Friction and Viscous Flow, Global Circulation, Stratified Fluids, Froude Number, Waves, Boundary Layer, Non-linearity, Modeling, Geologic Applications
Unit 3:	Course Project Presentations

Daily course material will be provided in class and through Moodle.

Changes to the Unit Topics and Calendar will be announced in class.

Accessibility/Accommodations:
Concord University is committed to responding to the needs of students with disabilities as defined by the Americans with Disabilities Act. Please inform your instructor at the beginning of the class semester if you have a disability and are requesting accommodations. It is your responsibility to self-disclose that you are requesting accommodations. The University and instructor will provide you with a reasonable accommodation. You should register with CU's Disability Services Office, located in the Athens campus Jerry and Jean Beasley Student Center, Bottom Floor, across from the Campus Post Office. The Disability Services Office phone is 304-384-6086 or you can email the Director, Nancy Ellison, at nellison@concord.edu for assistance.

Academic Dishonesty
Academic dishonesty is morally unacceptable as well as destructive to the learning and teaching atmosphere. Academic dishonesty includes the giving or receiving of improper help on examinations or assignments, falsifying documents, and plagiarism (the act of stealing and using, as one's own, the ideas or the expression of the ideas of another). Such dishonesty can lead to a variety of penalties — including but not limited to failure of assignment, failure of course, loss of institutional privileges, or dismissal from the University. (See University Catalog Academic Policies and Procedures.)

Concord University Honor Code
A Concord University Honor Code was approved by students, staff, faculty, administration, and the CU Board of Governors. The Code states:
"As a member of the Concord University Community I will act with honesty and integrity in accordance with our fundamental principles and I will respect myself and others while challenging them to do the same."
The Honor Code is intended to unite the Concord community behind a culture of honesty, integrity, and civility.

Class/Online Attendance Policy
Regular class attendance is part of a student's academic obligation at Concord. Irregular attendance may affect academic performance adversely and is detrimental to the atmosphere of a class. (See University Catalog Academic Policies and Procedures.)

Emergency Alert System
In an effort to increase safety and security on our campus, Concord University encourages everyone to register for instant text message alerts. Alerts will only be used for security and safety notices. All students, faculty, and staff are eligible to receive text message alerts on their cell phones or email alerts. Please contact the IT Help Desk for further assistance (304-384-5291).

Emergency Information
Emergency/courtesy telephones are located at the main entrance of each residence hall and at various other locations on campus. Emergency telephones can be identified by the flashing blue light and will provide the user with a direct link to Public Safety at the press of a button. To report an on-campus emergency, call 304-384-5357 or 911. The Office of Public Safety is located on the bottom floor of the Rahall Technology Center. For further emergency information go to:
http://www.concord.edu/administration/office-public-safety.

Inclement Weather Policy

As a general policy, the University will remain in normal operations during adverse weather conditions. In the event of severe weather conditions, the following may occur:

University Closure

No students or employees are to report.

Classes Cancelled

Students do NOT report BUT employees are expected to report to work at their normal time.

Operating on an Inclement Weather Delay

Under this schedule, all 8 a.m. classes will start at 10 a.m. Students and faculty will follow the Inclement Weather Schedule. (See http://www.concord.edu/emergency-alerts for Athens/Beckley Inclement Weather Schedules.)

**Announcements invoking the late schedule or other options referenced above are aired on area radio and television stations and are sent as text and email messages to those enrolled for this service.*

Student Conduct

In classrooms, online, laboratories, and during any activities that are part of course requirements, students are expected to observe reasonable rules of conduct.

Sexual Harassment & Assault

Federal law, Title IX, and Concord University policy prohibits discrimination, harassment, and violence based on sex and gender (Including sexual harassment, sexual assault, domestic/dating violence, stalking, sexual exploitation, and retaliation). If you or someone you know has been harassed or assaulted, you can receive confidential counseling support through the Concord University Counseling Center (304-384-5290). Alleged Violations can be reported non-confidentially to the Concord University Title IX Coordinator at 304-384-6327 or titleix@concord.edu. Reports to Campus Security can be made at (304-384-5357). As an employee at Concord University, I am a mandatory reporter which means I must report any sexual misconduct I am made aware of. This includes verbal or written (such as in an assignment) disclosures of sexual harassment or sexual assault.

Technology Services

Contact the CU Help Desk at extension 5291 from campus or 304-384-5291 off campus. You may also e-mail cuhelpdesk@concord.edu.

Syllabus Disclaimer

"This syllabus is subject to change based on the needs of the class. Please check it regularly."