Differential Equations I, II
MTH 421/521, Winter 2020
MTH 422/522, Spring 2020,

**Professor:** J. J. P. Veerman
**Class meets:** MWF 12:45 - 13:35 in FMH 234.
**Office:** FMH 464B (503-725-8187)
**Office Hours:** MWF 13:35 - 13:55 or by appointment.
**Email:** veerman@pdx.edu
**Web Page:** http://web.pdx.edu/~veerman/


**General Description:** This is a joint graduate (Mth 521/2) – undergraduate (Mth 421/2) class. The two courses must be taken in sequence. The content focuses on the following topics. Vectorfields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. We will cover some of the following additional topics, such as: Chaos, Attractors, Symbolic Dynamics, and Applications in Biology and Mechanics (such as Predator-Prey Systems and the Two-Body Problem). If time permits we will discuss synchronization of coupled agents (important in neurodynamics) and complex dynamics (Mandelbrot Sets and Julia Sets). These two courses form a sequence of two, and they must be taken in sequence.

**Prerequisites:** Mth 256 and Mth 312.

**Grading:** Your course grade will be based on in-class exams and/or quizzes. Homeworks will be assigned, and the exams/midterms will in large part be drawn from those assigned homeworks. In homeworks and projects, collaboration is allowed and encouraged. Plagiarism, however, is not tolerated. You must turn in original work. All answers on any work you turn in (home works, quizzes, or exams) must be justified, even if that is not evident from the phrasing of the question. Answers without justification will receive partial credit at best. Before turning in exams or home works, write your first plus last name in the top right corner of each sheet you turn in (even if you staple them together)!

**Attendance:** You are expected to attend classes. Home works, changes to this syllabus or to the scheduling of exams will be announced in class. If you have to miss class, it is your responsibility to find out what happened in class from your classmates.

**Homework:** As material is covered in class, a list of accompanying homework will be assigned. Reading the text and completing the homework is essential to your success in this course, and it will likely require a substantial amount of time and effort on your part to complete it successfully. You may find it helpful to form a study group with 2-5 other students and work together outside of class on the assignments. However, each student must write up and submit his or her own work. Plagiarism from either the web, your colleagues, or any other source is unacceptable at Portland State, and cases may be referred to the Dean Students for action. Homework (if due) must be turned in on the due date at the beginning of the class. **HW 10 minutes late or more will not be accepted, except in cases governed by university guidelines (illness, etc).**

**Exams:** If given, exams or quizzes are cumulative and will cover all assigned exercises and theory. Dates and times for finals are set by the University. Before taking the final, students must double-check the following information on the University web-site.
Access and Inclusion for Students with Disabilities: PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. My goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me. The Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment.

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations. The DRC is located in 116 Smith Memorial Student Union, 503-725-4150, drc@pdx.edu, http://www.pdx.edu/drc.

If you already have accommodations, please contact me to make sure that I have received a faculty notification letter and discuss your accommodations.

Students who need accommodations for tests and quizzes are expected to schedule their tests to overlap with the time the class is taking the test.

For information about emergency preparedness, please go to the Fire and Life Safety webpage (http://www.pdx.edu/environmental-health-safety/fire-and-life-safety) for information.

The Dean of Students has put together a web site that helps to navigate issues that regularly arise with students:

https://sites.google.com/pdx.edu/studentliferesources/topics

Title IX Reporting Obligations:

As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. Please be aware that as a faculty member, I have the responsibility to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information about sexual harassment, sexual violence or discrimination to a confidential employee who does not have this reporting responsibility, you can find a list of those individuals or contact a confidential advocate at 503-725-5672. For more information about Title IX please complete the required student module Creating a Safe Campus in your D2L.