MTH321: Ordinary Differential Equations  
Fall 2018  
MWF: 1:35-2:30 Franz 205

Instructor Information

Eli Goldwyn  
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Course Web Page: https://sites.up.edu/goldwyn/odes/

Course Description and Learning Objectives This course introduces the basic techniques and theory of ordinary differential equations, especially as related to problems in the physical sciences. It is aimed at math, engineering, and science majors that have taken the first two semesters of calculus. Topics covered will include solution techniques for first and second order linear equations, separable equations, qualitative methods, systems of linear equations, and Laplace transform methods. Other topics may be covered as time allows. By the end of this course, students should be able to

- articulate the fundamental ideas of the theory of first order ordinary differential equations  
- apply standard techniques for solving first and second order differential equations as well as systems of equations  
- use qualitative methods to analyze first order equations and systems of equations  
- use Laplace transform methods to solve linear equations  
- effectively communicate solution techniques in oral and written work

Text Ordinary Differential Equations: A Primer on Dynamics and Systems by C. Hallstrom.

Calculators and Computers You may use a calculator or computer on homework and in fact some homework problems might require the use of some kind of computational device. Unless otherwise instructed, however, you should always try to provide an exact answer rather than an approximation when possible. If you do use technology at some point in a solution (e.g. your calculator or Wolfram Alpha) please indicate this in your write-up.

From time to time, I will make use of the computer package MATLAB for in-class demos. You may also find MATLAB very useful for some homework problems. MATLAB is available in the Franz computer labs; no prior experience is necessary and I will provide instructions as needed.

Office Hours Office hours are an important part of this class. You may have questions while reviewing your notes or doing homework and you might not want to wait until the next class to get help. Please also keep in mind that there will not always be enough time to answer everyone’s questions in class. I therefore expect that if you do have questions you will come to my office for help. You are also welcome to schedule an appointment (via email is best).
Homework Assignments  Homework problems will be assigned in class (and posted on the class website) every week and will be due on Fridays at the beginning of class. The assignments will typically include both straightforward (short-answer) exercises as well as longer, more challenging problems that will require more time and thought to complete. I strongly suggest that you begin working on the assignment as early as possible to give yourself time to complete the assignment. An early start will also give you time to ask questions if you need to.

Please adhere to the following guidelines for HW:

- The problems should be written in numerical order and work on individual problems well organized;
- Please invest in a **stapler**, individually or in a cohesive group, and use it to staple your pages in the upper left corner. Please staple the entire HW assignment together. Paper clips or the way you may have learned to ‘cleverly’ fold this corner are actually useless and annoying;
- Please remove the “fringe” on the side of any pages that you have torn from a notebook;
- At the top of the first page write your name and the HW assignment.

No late assignments will be accepted, except those approved by the instructor due to an excused absence. No credit will be given on problems for which an answer is given with insufficient work displaying the steps and reasoning needed for a solution. Where appropriate, answers must be written using complete sentences.

Homework Grading  The homework assignments serve two equally important purposes. The first is to give you practice applying the ideas and techniques covered in class and in the book. The second is to give you practice in communicating your work to others. Your goal is not just to simply provide an answer, but to convince your reader that your solution is correct.

Each HW problem will be graded as 0, 2, or 5. A 5 on your HW means it is near perfect – complete, thoroughly explained, and correct (except for perhaps one or two tiny mistakes) – and has earned full credit. You’ll receive a 2 on your HW when it is clear that you’ve made a good effort but there is some room for improvement. A 0 means that you’ve done little to no correct work.

**HW Rewrites.** Since the purpose of HW is to help you learn the material, however, I believe that it is an ideal place to practice, make mistakes, and then correct them. Knowing you’ve made a mistake is useful, but learning how to correct it is much more valuable. Therefore, you may re-do any problems where you scored a 2 and turn that in the following week. If you choose to resubmit HW, please include your original assignment with your rewritten version so that the grader can compare them.

Exams  We will have two in-class midterm exams and a final exam. The date and time of the final exams are set by the registrar’s office and are not subject to change; please plan your travel accordingly.

Grades  Final course grades will be based on a weighted average of quizzes and other in-class activities, homework assignments and exams as follows:

- 5% Participation and other in-class activities
- 20% Homework
- 40% Midterm exams (20% each)
- 35% Final exam
Final grades in the course will be determined at the end of the semester, and will be at least as general as the following table (with the appropriate +/- applied at the instructor’s discretion). If you have any questions or concerns about your grade in this course, at any time during the semester, please come see me. I will be happy to go over your grade with you.

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<tr>
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<tr>
<td>A</td>
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<td>D</td>
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<td>F</td>
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University Policies & Resources

University of Portland’s Code of Academic Integrity  Academic integrity is openness and honesty in all scholarly endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. Breaches of academic integrity will not be tolerated and will be addressed by the community with all due gravity. Please see the University Bulletin for policy:  http://up.smartcatalogiq.com/en/2016-2017/bulletin/University-Academic-Regulations/I-Code-of-Academic-Integrity

Assessment Disclosure Statement  Student work products for this course may be used by the University for educational quality assurance purposes.

Accessibility Statement  Students who experience a disability and require an accommodation to fully participate in this class, contact the Accessible Education Services office, located in Buckley Center, Rm. 163 or call 503-943-8985. If you have an AES Accommodation Plan that includes academic accommodations that apply to this course, make an appointment to meet with your professor to discuss how your accommodation will be implemented. You are responsible for giving sufficient notice to your professor for timely implantation of your accommodation; therefore it is recommended you speak with your professor in the first week of the semester or as soon as your accommodation plan is activated. Also, meet with the professor if you have an AES Safety Plan and/or wish to discuss emergency medical information or special arrangements in case the building must be evacuated. Requests for alternate location for exams and/or extended exam time should, when possible, be made two weeks in advance of an exam, and must be made at least one week in advance of an exam.

Shepard Academic Resource Center (SARC)  The Learning Resource Center, located on the first floor of Buckley Center within SARC (BC 163), provides peer assistance tutoring for writing, math, speech and presentations, languages, business and economics, sciences and nursing. For Writing. Go to http://www.up.edu/learningcommons/writing-center. You will need to register as a user the first time you go to the website. If you cannot make any of the posted office hours, you can arrange an appointment by emailing writing.up.edu. For Math. Math assistants are available on a walk-in basis. Please go to http://www.up.edu/learningcommons/math-resource-center for a current schedule of hours math assistants are available. For Speech and Presentations. Speech assistants from the Communication Studies Department are available by appointment only. Just send a request to: speech@up.edu. For International Languages. Language assistance is available by appointment; go to http://www.up.edu/learningcommons/language-assistance and send an email to the target language. For Biology and Chemistry. The Chemistry Department offers peer mentoring on a walk-in and appointment basis. The Biology Department offers peer mentoring on a walk-in and appointment basis. For Business and Economics. In collaboration with the Pamplin School of Business, the Learning Commons now offers peer learning support in Economic and Business Law by appointment only. Go to http://www.up.edu/learningcommons/Economics-and-Business for appointment information. Learning Assistance Counselor. Learning assistance counseling is also available in BC 163. The counselor teaches learning strategies and skills that enable students to become more successful in their studies and future professions. The counselor provides strategies to assist students with reading and comprehension, note-taking and study, time management, test-taking, and learning and remembering. Appointments can be made in the on-line scheduler.
available to all students in Moodle or during posted drop-in hours.

**Mental Health Statement** As a college student, you may sometimes experience problems with your mental health that interfere with academic experiences and negatively impact daily life. If you or someone you know experiences mental health challenges at UP, please contact the University of Portland Health and Counseling Center in Orrico Hall (down the hill from Franz Hall and Mehling Hall) at [http://www.up.edu/healthcenter/](http://www.up.edu/healthcenter/) or at 503-943-7134. Their services are free and confidential, and if necessary they can provide same day appointments. Also know that the University of Portland Public Safety Department (503-943-4444) has personnel trained to respond sensitively to mental health emergencies at all hours. Remember that getting help is a smart and courageous thing to do for yourself, for those you care about, and for those who care about you.

**Non-Violent Community Statement** University of Portland Faculty, Staff, and Students are committed to creating a community free of interpersonal violence, in which all members feel safe and respected. Each of us has a personal responsibility to reject violence or intimidation of any kind. Resources for those experiencing or wishing to report violence can be found on our community against violence website: [http://www.up.edu/cav/](http://www.up.edu/cav/)