Math 307 G, J Course Information

Winter Quarter 2015
Introduction to Differential Equations

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time and Place</td>
<td>Math 307G: MWF 1:30-2:20 Chemistry Library (CHL) 015</td>
</tr>
<tr>
<td></td>
<td>Math 307J: MWF 2:30-3:20 Chemistry Library (CHL) 015</td>
</tr>
<tr>
<td>Instructor</td>
<td>Andrey Sarantsev</td>
</tr>
<tr>
<td>Instructor's Office</td>
<td>Padelford Hall (PDL) C552</td>
</tr>
<tr>
<td>Instructor's Email</td>
<td><a href="mailto:ansa1989@math.washington.edu">ansa1989@math.washington.edu</a></td>
</tr>
<tr>
<td>Office Hours</td>
<td>Mon 4-5, Tue 10-12, 1-3:30, 4-5 in Math Study Center, CMU B014, or by appointment</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Math 307G: Monday, March 16, 2:30-4:20 CHL 015</td>
</tr>
<tr>
<td></td>
<td>Math 307J: Tuesday, March 17, 2:30-4:20 CHL 015</td>
</tr>
</tbody>
</table>

**Syllabus.** This course covers ordinary differential equations (ODE).
1. First-order linear and separable equations.
2. Autonomous equations and stability.
3. Euler’s numerical method.
4. Applications of first-order equations to physics, biology, chemistry and finance.
6. Connection between homogeneous and nonhomogeneous second-order linear equations.
7. Second-order linear equations with non-constant coefficients. Variation of parameters.
8. Application to mechanical and electrical systems.
10. Formulas for Laplace transform of first and second derivative.
12. Second-order equations with discontinuous right-hand sides.

**Prerequisites.** Math 124/5, grade 2.0, or equivalent courses from other colleges/universities. Math 126 is recommended.

**Do you need this?** This course is often chosen by future STEM (Science, Technology, Engineering and Math) majors. However, it is pretty advanced, so it is likely too hard for students of other majors, e.g. humanities, arts, business, pre-med, communications, etc. If you are in such major or not sure about your future major, think twice before registering for this course!

**Textbook.** There is no textbook. Lectures and homework will be posted online, and homework will not refer to a textbook.

**Homework.** Each homework assignment is due on Wednesday at the beginning of the class, starting from the third week. Late homework will not be accepted for any reason. There are 8 assignments, during weeks 3-10. It should be hand-written (we do not use Webassign for this course). Each assignment will be graded and returned to you within a week.
**Quizzes.** There are seven quizzes, on Fridays of weeks 3-9. Each of them is 20 minutes long at the end of the lecture and contains two problems, covering the last homework assignment. You are NOT allowed a cheat sheet on quizzes. You will not need a calculator, but if you really want to have one, it must be TI-30XIIS.

**The Final Exam.** Date and time: see above. The exam contains six or seven problems and is cumulative, which means that it covers the whole course. You are allowed a cheat sheet of standard form: 8.5x11 inches, double-sided. You do not need to submit it after the Final Exam. You will not need a calculator, but if you really want to have one, it must be TI-30XIIS.

**Grading Issues.** Each quiz will be handed back to you the Monday after it was given. Re-grade requests can be made during the following week. The final will be graded during the break and will be available from the beginning of the Spring Quarter.

**Grading Scheme.** It is preliminary and is subject to change. The median will be in the range 2.9–3.1. You are allowed to drop one homework assignment and one quiz.

- 3% each homework (except the dropped one)
- 8% each quiz (except the dropped one)
- 31% the Final Exam

**Make-Ups.** Late homework will not be accepted for any reason. In case of observance of religious holidays or participation in university sponsored activities, arrangements must be made at least 2 days in advance for quizzes and exams. You will be required to provide documentation for your absence. Make-up quizzes and the final will not be given. If you miss the final (or one of the quizzes) due to unavoidable, compelling, and well-documented circumstances, your quizzes (respectively, the final) will be weighted more heavily.

**Registration.** If you want to get into this course, but it is already full, try to get into other sections of this course which fit your class schedule. Also, during the first week you should check the online registration system all the time. The Time Schedule is only updated once a day, so for the most up to date information check the Enrollment Summary which is updated every time a change is made (link located in the top right corner of the Time Schedule). There is a lot of moving in and out during the first week, so there is a fairly good chance that you will be able to register in the usual way. You should also attend the lectures, even if you are not formally registered yet. If you do not succeed by the beginning of the second week, then come to me and let us talk in person; I will try to give you an overload. For more questions, please visit the Student Services Office at the Mathematics Department in Padelford C36.

**Respect Issues.** Disrespect will not be tolerated. As with all your life, you should treat others just like you yourself would like to be treated. Come to class on time (better never than late) and do not leave class early. If you can special circumstances where you need to arrive late or leave early, please contact me ahead of time and sit close to the door so that you do not distract your classmates when you enter or exit.

Do not use electronic devices during class. If you want to listen to your iPhone, send text messages to your friends, or play on your computer, then don’t come to class. This is completely disrespectful to me and your classmates. So please put away and turn off your electronic devices before class.

Finally, please show me respect when you have a question for me or when you send me an e-mail. You are well within your right to ask about homework and exam grading, but you will get nowhere if
you are argumentative or rude. I will do everything I can to help you all succeed in this course. I put in a lot of extra time and effort to help each of you in any way that I can. In fact, lecturing and having full responsibility for the whole course is not easy at all. This effort deserves and demands your respect! We should all be working together, not against one another.

**Class Philosophy.** There are two vital rules for success in this classroom.

1. **THE HOMEWORK IS THE KEY.** In mathematics, breakthroughs in learning rarely occur while reading the text or attending lecture. Mathematics is truly learned when you completely solve a problem yourself and understand the underlying concepts and tools so as to be able to apply them to related problems. The lecture, tutorial sessions, and office hours are valuable tools in guiding you towards learning and discovery, but ultimately the concepts and solutions must be absorbed, understood, and applied by you alone.

   Treat each problem as an exam question and ask yourself, “Can I answer this question without any help and do I understand the underlying principles that this problem conveys?” If your answer is no to either of these question (or if you hesitate at all), then you need more studying and practice.

2. **ASK FOR HELP.** Many students will hit a wall at some point during the course. Some can’t handle the large workload, while others find difficulty with specific concepts in the course. When these times arrive remember to ask for help. Come to me, ask your classmates for help, visit the math study center and/or visit the student counseling center. I have a lot of office hours: five hour each week! You can also send me emails; I usually answer them quickly.

   You are never more than a step away from getting help. These are just a few of your options. Please, please, please find help earlier rather than later. You are all smart enough to do well in this course; the question is whether or not you are determined enough.

**Attending Office Hours.** Even if you do not have any questions, you are very welcome to attend my office hours just to chat about life, expand the material of the course, find out something about me, etc. I will have additional office hours before the final exam, time TBA.

**Additional Resources.**

1. The Center for Learning and Undergraduate Enrichment (CLUE) holds drop-in tutoring sessions every weekday evening in Mary Gates Hall Commons. See [http://depts.washington.edu/clue/](http://depts.washington.edu/clue/) for more details.

2. This is the list of tutors: [http://www.math.washington.edu/Undergrad/tutorlists.php](http://www.math.washington.edu/Undergrad/tutorlists.php)

3. The University of Washington is committed to providing access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodations contact the Disability Services Office at least ten days in advance at: 206-543-6450/V, 206-543-6452/TTY, 206-685-7264(FAX), or [dso@u.washington.edu](mailto:dso@u.washington.edu)