**Math 245 – Mathematics of Physics and Engineering**

**Summer 2015 – SYLLABUS – Section 39435R**

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**Instructor**: Guillermo Reyes

**Office:** KAP 444B

**Phone:** 213-740-7285

**Email**: guillermo.[reyes@usc.edu](mailto:reyes@usc.edu)

**Web site**: https://dornsifecms.usc.edu/guillermo-reyes-souto/

**Lecture hours and location:** MWF 10:30 am – 12:20 pm, KAP 137

**Discussion hours and location** : TuThu 10:30 am – 12:20 pm, KAP 137

**Office hours**: MWF 1:00 pm – 3:00 pm or by appointment, KAP 444B

**TA**: Melike Sirlanci

**Email**: [sirlanci@usc.edu](mailto:sirlanci@usc.edu)

**Office:**  KAP 406K

**TA's office hours:** TuThu, 1:00 - 2:00 pm

**Course Description:**

We will cover the fundamentals of ordinary differential equations:

1. First order equations and elementary methods of integration. Some geometric applications.
2. Higher order linear equations with constant coefficients and the Laplace transform. Applications to harmonic motion.
3. Systems of first order linear equations. General solution by matrix methods in the case of constant coefficients. Non-homogeneous systems and variation of parameters. Relation to higher order scalar equations. The Wronskian.
4. Critical (stationary) points of autonomous systems in the plane. Full study in the case of homogeneous linear systems with constant coefficients (phase portraits). Linearization and stability of critical points in the nonlinear case. Some applications (small oscillations, Lotka-Volterra, etc.)

**Textbook:** Elementary Differential Equations and Boundary Value Problems, W.E. Boyce, R.C. DiPrima, Wiley, Ninth Edition (2009).

**Important dates**:

Beginning of classes: Wednesday, May 20th.

Last day to drop the class without a mark of “W” and a refund: Monday, June 1st.

Last day to drop the class with a mark of W: Tuesday, June 30th.

Midterms: Wednesday, June 3rd and Monday, June 22nd

End of classes and Final Exam: Tuesday, July 7th.

**Tentative schedule:**

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| **Week** | **Dates** | **Textbook Sections** |
| 1 | May 20 - 22 | Chapter 1 |
| 2 | May 27 - 29 | Chapter 2 |
| 3 | June 1 - 5 | Chapter 2 - Review/Midterm - Chapter 3 |
| 4 | June 8 - 12 | Chapter 3 - Chapter 3/4 - Chapter 4/6 |
| 5 | June 15 - 19 | Chapter 6 |
| 6 | June 22 - 26 | Review/Midterm - Chapter 7 - Chapter 7 |
| 7 | June 29 - July 1 | Chapter 9 |
| 8 | July 6 - 7 | Review - Final |

**Grading:**

Homework will be assigned at the end of each week, except for week 8, to be turned in the next Thursday. Quizzes will be given in discussion classes every week, except for week 8.

There will be two midterm exams (50 min.) and one final exam (2h), on the above indicated dates.

All exams and quizzes are **closed-book** and **closed-notes**. **No calculators** may be used during the exams unless otherwise stated before the day of the exam.

There will be no make-up exams or quizzes and no late submissions of homework will be accepted, unless special circumstances are presented to the instructor.

Before the drop deadline (June 30th) I will post a letter grade based on the grades on homework, quizzes and the Midterm, according to the following **grade distribution:**

Quizzes = 15%. The lowest three grades will be dropped.

Homework = 15%. The lowest three grades will be dropped.

Midterms = 20% each

Final Exam = 30%

**Students Requiring Special Accommodation**

Any student requesting academic accommodations based on special needs is required to register with DSP each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

**Academic Integrity**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

**Other comments:**

Official announcements, homework assignments, grades, etc. will be posted on USC Blackboard. You are expected to check Blackboard on a regular basis.

If for some reason you cannot take a midterm exam, or the final, please let me know in advance to find a solution.

Do not hesitate to ask questions. Walk-ins are welcome during office hours, and you can also make appointments to see me at other time. Your TA is also ready to help you.

There are tutors available to help you at the Math Center. The Math Center is located in KAP 263, and is open Monday to Thursday from 8am to 7pm and Friday from 8am to 5pm.

Here is a link to the Math Center if you need further information: https://dornsife.usc.edu/mathcenter