

## **AMS-501**

### **Ordinary Differential Equations (Advanced Topics)**

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Course web page:

<http://www.ams.sunysb.edu/~rosamu/Teaching/AMS501/>

**Textbook:** Carl Bender and Steven Orszag, *Advanced Mathematical Methods for Scientists and Engineers I: Asymptotic Methods and Perturbation Theory*, Springer, ISBN: 978-0-387-98931-0

**Course description:**

This course will give practical and self-contained presentation of the methods of asymptotics and perturbation theory and explain how to use these methods to obtain approximate analytical solutions to ordinary differential equations. These methods allow one to analyze ordinary differential equations arising in numerous application that may not be solvable in closed form and for which direct numerical methods may not be practical or even may fail to converge to useful solutions. The objective of this course is the teaching of insights and problem-solving skills that are most useful in solving ODE problems arising in the course of modern research. Intended for graduate students and advanced undergraduates, the course assumes some familiarity with differential equations and complex variables within a typical undergraduate ODE course. A brief overview of the background material - theory and methods for (systems of) ordinary differential equations will also be given.

**Classes:** Tuesdays and Thursdays, 2:20 – 3:40 pm,  
Physics P125

**Attendance:** Students are expected to attend all classes. Students are encouraged to ask questions during and after the class.

**Office hours:** Tuesdays and Thursdays, 11:00 – 12:00 AM, or by appointment.

**Grading:** Homework assignments: 30%  
Midterm exam (in class): 30%  
Final Exam (take home): 40%

## **Academic Integrity**

*Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>*

## **Americans with Disabilities Act:**

*If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.*