

# Methods in Applied Mechanics

Fall Quarter 2014

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This is the homepage for MAE294A during Fall Quarter 2014. Last updated: December 22, 2014.

## Practical details

Lectures: MWF 10-10:50 am, CSB 004. My e-mail address is [sgls@ucsd.edu](mailto:sgls@ucsd.edu), but if you have a question, talk to me before or after class, or come to office hours. Office hours: Tu 9-11 am. **It is your responsibility to come and find me if you have questions, concerns, etc...** TA: Daniel Freilich ([dfreilic@ucsd.edu](mailto:dfreilic@ucsd.edu)); office hours/problem class: M2-3 and M 5:30-6:30 in EBUII 305.

## Textbook

*Mathematical Methods for Physics and Engineering* by Riley, Hobson and Bence (2006, Cambridge University Press, 3rd edition, 1362 pages). It's probably worth buying. I have placed it on reserve at the [library](#), including an electronic copy.

## Syllabus

1. Basic solutions of linear and nonlinear ODEs.
2. Green's functions for ODEs.
3. First order PDEs. The method of characteristics.
4. Classification of PDEs and important examples (heat, Laplace and wave equations).
5. Separation of variables.
6. Green's functions for PDEs.
7. Similarity solutions.

## Lecture Schedule (provisional)

- Oct 3: **I Linear ODEs**
- Oct 6: (Cont.)
- Oct 8: (Cont.)
- Oct 10: (Cont.)
- Oct 13: (Cont.)
- Oct 15: (Cont.) **HW I due**
- Oct 17: (Cont.)
- Oct 20: (Cont.)
- Oct 22: (Cont.) **HW II due**
- Oct 24: (Cont.)
- Oct 27: (Cont.)
- Oct 29: **Midterm I**

- Oct 31: (*Cont.*)
- **Nov 3:** [Bessel function handout](#). **II Nonlinear ODEs**
- Nov 5: (*Cont.*) **HW III due**
- Nov 7: **I will be away** (*Cont.*)
- **Nov 10:** **III PDEs General and Particular Solutions**
- Nov 12: (*Cont.*) **HW IV due**
- Nov 14: (*Cont.*)
- **Nov 17:** (*Cont.*)
- Nov 19: (*Cont.*) **HW V due**
- Nov 21: (*Cont.*)
- **Nov 24:** **I will be away**
- Nov 26: (*Cont.*)
- Nov 28: **Thanksgiving holiday**
- **Dec 1:** **IV Separation of Variables**
- Dec 3: **Midterm II**
- Dec 5: (*Cont.*)
- **Dec 8:** (*Cont.*)
- Dec 10: **HW VI due**
- Dec 12: (*Cont.*)

## Homework

Homework policy: you may discuss problems among yourselves, but everything you write and hand in should be your own work. Regrades: you should write a short explanation and turn it in to Daniel within one week of the homework being due.

- **I** Due Oct 15. [Solution.](#)
- **II** Due Oct 22. [Solution.](#)
- **III** Due Nov 5. [Solution.](#)
- **IV** Due Nov 12. [Solution.](#)
- **V** Due Nov 19. [Solution.](#)
- **VI** Due Dec 10. [Solution.](#)

**Practice problems:** see last year's website

## Midterms

50 minutes, in class.

- **I** 10/29. [Solution.](#)
- **II** 12/3. [Solution.](#)

[Suggestions about homework and the like \(from 2005\)](#)

## Final

Friday December 19, 2013: 8:00-10:59 am. [Solution.](#)

## Grading policy

I remind you of UCSD's [policy](#) on academic integrity. I may rescale the three components (homework, midterm, presentation and project) separately to arrive at the final grade. See [practical details](#).