

AME 526: Engineering Analytical Methods

Fall 2017

Instructor: Prof. Niema M. Pahlevan

Office: 220 Rapp Eng. Bldg.

Email: pahlevan@usc.edu (Only non-scientific questions or yes-or-no questions will be answered by e-mail)

Office hours: M 3:30-5:30; or by appointment.

Lecture hours: MW 2:00-3:20, OHE 132

Midterm exam: Week of October 9th

Final exam: December 6-13 (exact day and time TBD)

TAs: TBD

TA Office Hours: TBD

The course will cover elementary applied mathematical methods for solving linear partial differential equations that arise in engineering. This course has two major goals: (1) enhance student's ability to perform more complex mathematical analyses of engineering problems; (2) improve students' understanding of how mathematical applications are defined, derived and related. There are 11 parts to the course:

- Review and introductory concepts
- Fourier methods
- Introduction to Green's functions
- The method of separation of variables
- The method of characteristics
- Sturm-Liouville theory
- Diffusion equation
- Laplace's equation
- Linear waves
- Numerical methods
- Special topics

Textbook:

Applied Partial Differential Equations 5th Ed., R. Haberman

Other recommended books:

- 1- Myint-U, Tyn, and Lokenath Debnath. "*Linear Partial Differential Equations for Scientists and Engineers 4th Edition.*" (2006).
- 2- Kythe, Prem K. " *Green's functions and linear differential equations: Theory, applications, and computation.*" CRC Press (2011).
- 3- Duffy, Dean G. *Green's functions with applications.* CRC Press (2015).
- 4- Kreyszig, Erwin. *Advanced engineering mathematics 10th Edition.* John Wiley & Sons, 2011.

Grading: Homework 20+5%; Midterm 40%; Final 40% (Total: %100+%5 bonus)

Curved grading will be applied

No late homework accepted.

Your lowest HW grade will be dropped.

Important policies (please adhere):

- Final grade will depend entirely on the performance on the above components, and be independent of the financial support requirements (e.g., minimum grade requirement for tuition reimbursement).
- Please schedule your work-related travel during time periods outside of the mid-term and final exams. Accommodation to take exams on different dates will be made for only family emergencies and documented illness or health-related emergencies. Other exceptions will be considered on a case-by-case basis.