

Math 480 - 10 Engineering Outreach

Fall 2020

Course: **Partial Differential Equations**
Professor: Lyudmyla Barannyk
Office: Brink Hall 317
Phone: (208) 885-6719
e-mail: barannyk@uidaho.edu
Book: *Applied Partial Differential Equations, 5th Ed.*
by Richard Haberman

Course web site: <http://www.webpages.uidaho.edu/~barannyk/Teaching/Math480.html>

Topics covered:

- The Heat Equation (Chapter 1)
- Separation of Variables (Chapter 2)
- Fourier Series (Chapter 3)
- The Wave Equation (Chapter 4)
- Sturm-Liouville Eigenvalue Problems (Chapter 5)
- Higher-Dimensional PDEs (Chapter 7)
- Nonhomogeneous Problems (Chapter 8)
- Fourier Transforms (Chapter 10) (a brief introduction)

Written lecture notes are available on the course website:

<http://www.webpages.uidaho.edu/~barannyk/Teaching/Math480.html>

Exams: *Midterm Exam 1:* due by Friday, October 2

Midterm Exam 2: due by Friday, November 6

Final Exam: due by Thursday, December 17

Homework: Homework will be assigned on approximately weekly basis. Some of the problems will involve Matlab programming. A random selection of problems will be graded. On-campus students should submit their homework in class on a due date. Engineering Outreach students, please scan your homework assignments, save them in a pdf format (single .pdf file for each assignment) and submit them by email to barannyk@uidaho.edu by the end of the due day. There is a 3 business day grace period. Late homework after the grace period will not be accepted.

Course Grade:

| | |
|-----------------|-----|
| Midterm Exam 1: | 15% |
| Midterm Exam 2: | 20% |
| Final Exam: | 25% |
| Homework: | 40% |

For Your Information:

Matlab software is available through VLAB at <http://vlab.uidaho.edu>. Students are encouraged to contact IT help desk if help is needed to find where to store files and how to access Matlab as soon as possible. Some Matlab tutorials are available on the course web site.

ITS HELP DESK

Phone: 208-885-4357 (HELP); Email: helpdesk@uidaho.edu

Physical Address: Teaching Learning Center Room 128

IT help desk website: <http://www.uidaho.edu/its/>

Websites for help with MatLab.

- <http://www.mathworks.com/>
- <http://www.math.ufl.edu/help/matlab-tutorial/>
- <http://www.engin.umich.edu/caen/technotes/matlab.pdf>
- <http://www.me.pdx.edu/~gerry/MATLAB/>
- <http://www.engin.umich.edu/class/ctms/basic/basic.htm>

Learning Outcomes:

- The students will gain a fundamental understanding of some classic PDEs (such as the wave and heat equation) and techniques for solving PDEs
- The students will study standard topics such as the method of separation of variables, Fourier series, orthogonal functions, and Fourier transforms
- The students will learn about differentiation and integration of Fourier series, Sturm-Liouville problems, Rayleigh quotient, Bessel functions and Legendre polynomials