# Math 4263 - Partial Differential Equations

## Syllabus - Summer 2015

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| Instructor: | Dr. Birne Binegar<br>430 Mathematical Sciences<br>Tel. 744-5793<br>Email: binegar@okstate.edu<br>Office Hours: TTh , 3:45 - 4:30, North Hall 367A, OSU Tulsa |
| Lectures: | TTh , 4:30 - 7:10 , North Hall 212, OSU Tulsa |
| Course URL: | http://lie.math.okstate.edu/~binegar/4263/4263.html |
| Text: | *An Introduction to Partial Differential Equations*,<br>by Y. Pinchover and J. Rubinstein,<br>Cambridge Univ. Press (2005) ISBN: 978-0521613231 |
| Prerequisites: | Ordinary Differential Equations and Vector Calculus |
| Course Objectives: | The theory of partial differential equations will be developed by a systematic study of relatively simple yet important examples. Special emphasis will be placed on techniques of solution and boundary value problems. |
| Homework: | Homework will be assigned **daily**, and it is expected that a student work out a day's assignment **before** the next lecture. All the homework assigned during a given week will be due at the beginning of the first class of the following week. |
| Examinations: | There will be one midterm examination worth 100 pts and one final examination worth 175 pts. |
| Grades: | Grades will be determined exclusively from homework, midterm and final exam scores. |

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| 1 Midterm Examination | 100 possible pts. |
| Homework | 50 possible pts. |
| Final Examination | 150 possible pts. |
| | 300 possible pts. |

Letter grades will be assigned as follows:

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| A: | 270 | - | 300 pts. |
| B: | 240 | - | 269 pts. |
| C: | 210 | - | 239 pts. |
| D: | 180 | - | 209 pts. |
| F: | 0 | - | 179 pts. |

# Math 4263: Intro to PDEs
## Sequence of Topics

1. Review of Elementary ODE Theory
2. First Order Linear PDEs
3. Characteristics and First Order Equations
4. Second Order Linear PDEs
5. The Heat Equation
6. Maximum Principle and Uniqueness
7. The Wave Equation
8. Reflections off a Boundary
9. The Wave Equation with a Source
10. Separation of Variables
11. Fourier Series
12. Midterm
13. Sturm-Liouville Theory
14. Sturm-Liouville
15. Examples
16. Laplace's Equation
17. Laplace's Equation on a Disc
18. Distributions
19. Green's Identities and Green's Functions
20. Numerical Methods - Divided Differences
21. Finite Element Method
22. Laplace Transform Method