# Department of Mathematical Sciences
## Spring 2019, Math 412
## Partial Differential Equations

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| **Instructor:** | Dr. Emily Stone | **E-mail Address:** | stone@mso.umt.edu |
| **Office:** | MATH 004B | **Office Phone:** | 243-5365 |
| **Office Hours:** | M: 2-3, W: 10-11, F: 11-12 | | |
| **Class Web Page:** | http://www.math.umt.edu/stone/M412 | | |

**Course Description:** In this course we will cover the analytic solution of linear partial differential equations (PDEs). Two famous PDEs will form the backbone of the course: the heat equation and the wave equation, in one and two spatial dimensions. Solution techniques include separation of variables, method of characteristics, and Fourier Transforms. We will also cover some of the theory of Fourier Series as they are used in the solution of linear PDEs, and an introduction to Sturm-Liouville theory.

**Text:** • *Applied Partial Differential Equations*
John M. Davis, 1st Ed., W.H. Freeman & Co., N.Y.

**Prerequisite:** Math 311 or equivalent

**Important Dates:**

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| Jan. 18: | Last day to add courses via Cyberbear |
| Jan. 21: | MLK day - No Classes |
| Jan. 31: | Last day to drop courses via Cyberbear |
| Feb. 18: | President's Day Holiday - No Classes |
| March 18: | Last day to drop courses with W on transcript |
| March 25 - 29: | Spring Break - no classes |
| April 26: | Last Day for drop Petitions, WP or WF on transcript |

**Exam Dates: (tentative, will be confirmed in class)**

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| Feb. 8 (Friday): | Exam 1 |
| March 8 (Friday): | Exam 2 |
| April 30 (Tuesday): | Final Exam 10:10 a.m. - 12:10 p.m. |

**Grading:**

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| Homework | 40% of course grade |
| Exams | 40% of course grade |
| Final Exam | 20% of course grade |

**Homework Assignments:**

For this class homework is *absolutely essential* to the mastery of the material. Homework assignments will be made almost every week, and will be graded for completeness. Answers and some partial solutions will be made available. The list of homework problems which will be assigned is only a <u>minimal</u> list. You should do the more straight forward problems on your own as a warm-up. A computer or calculator may be used to aid with the calculations in the homework. You are encouraged to work together on the assignments, but are asked to write up the solutions individually. We expect your solutions to be clearly written, with thorough explanations. It often helps if you look over your solutions before you hand them in and ask yourself if a classmate could easily understand what you have written.

*Homework assignments will be due on Wednesdays by 2:00 p.m.. Homework up to 1 day late (Thursday 2:00 p.m.) will receive a 25% deduction, up to 2 days late (Friday 2:00 p.m.), a 50% deduction. Homework will not be accepted any later than 2 days past the due date.* You may hand in your assignment in class, or you can place it in the homework box in the main office, MATH 111. Please have your assignments stapled or paper-clipped on 8.5 by 11 inch paper.

**Readings:**

I will be working mainly from the text, but I will bring in supplemental material as needed. This will be in the form of hand-outs given in class, so if you need to miss a class, have someone pick up any hand-outs for you.

**Exam Information:**

There will be two mid-term exams and a final. The final exam will be cumulative with a slight emphasis on the material covered after the second mid-term. Make-ups for an exam will not be given unless you have a valid excuse and (if possible) you contact me prior to the exam.

**Grading:**

Grading will be done on the usual percentage scale, 90-100% A, 80-89 % B, etc.

**Student Conduct:**

All students need to be familiar with the Student Conduct Code. You can find it in the "A to Z Index" on the UM home page. All students must practice academic honesty. (That specifically means not copying homework solution sets, sharing information on exams, or plagiarizing material in written reports.) Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

**For any student with a disability:**

If you have a disability that has or might have an effect on your performance in this class, please let me know. I will do my best to accommodate you.

**Final Note:**

**Announcements made in class are considered addenda to this syllabus. Midterm exam dates are <u>t</u>entative, make sure you stay informed as to the progress of the class.**