

Spring 2010 Course Syllabus: Math 331-004

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| Course Title: | Introduction to Partial Differential Equations |
| Textbook: | Applied Partial Differential Equations by Richard Haberman (4th Edition) |
| Prerequisites: | Grade of "C" in Math 222 |
| Website: | http://web.njit.edu/~shahriar/class_home/math331.html |

| Date | Lecture | Sections | Topic |
|------|---------|-----------|--|
| 1/22 | 1 | 1.1-1.2 | Heat Equation: 1D Derivation |
| 1/25 | 2 | 1.3-1.4 | Heat Equation: Boundary Conditions, Equilibrium |
| 1/29 | 3 | 1.5 | Heat Equation: Higher Dimensions |
| 2/1 | 4 | 2.1-2.3 | Heat Equation: 1D Solution I |
| 2/5 | 5 | 2.4 | Heat Equation: 1D Solution II |
| 2/8 | 6 | 2.5 | Laplace's Equation: Solution |
| 2/12 | 7 | 3.1-3.3 | Fourier Series: Convergence |
| 2/15 | 8 | 3.4-3.6 | Fourier Series: Term-by-term Operations |
| 2/19 | 9 | 4.1-4.3 | Wave Equation: 1D Derivation |
| 2/22 | 10 | 4.3-4.4 | Wave Equation: Vibrating String |
| 2/26 | 11 | 5.1-5.2 | Sturm-Liouville Problems: Examples |
| 3/1 | 12 | Review | |
| 3/5 | 13 | MIDTERM | EXAM: Chapters 1-4 |
| 3/8 | 14 | 5.3-5.4 | Sturm-Liouville Problems: Theory, Application to Heat Equation |
| 3/12 | 15 | 5.5 | Sturm-Liouville Problems: Self-Adjointness |
| | | | SPRING RECESS: March 15-21, 2010 ~ NO CLASSES SCHEDULED |
| 3/22 | 16 | 5.6 | Sturm-Liouville Problems: Rayleigh Quotient |
| 3/26 | 17 | 5.7 | Sturm-Liouville Problems: Application to Wave Equation |
| 3/29 | 18 | 5.8 | Sturm-Liouville Problems: Mixed Boundary Conditions |
| 4/2 | | | GOOD FRIDAY ~ NO CLASSES SCHEDULED |
| 4/5 | 19 | 7.1-7.2 | Dynamic PDE's in Two Spatial Dimensions |
| 4/9 | 20 | 7.3 | Vibration of a Rectangular Membrane |
| 4/12 | 21 | 7.7 | Vibration of a Circular Membrane |
| 4/16 | 22 | 9.1-9.2 | Green's Functions: 1D Heat Equation |
| 4/19 | 23 | 9.3 | Green's Functions: BVP's for ODE's |
| 4/23 | 24 | 10.1-10.2 | Heat Equation on the Line |
| 4/26 | 25 | 10.3-10.4 | Heat Equation on the Line: Solution by Fourier Transform |
| 4/30 | 26 | 10.5 | Heat Equation on a Half-Line |
| 5/3 | 27 | 10.6 | Fourier Transform: Applications |
| | | | May 4, 2010: Last Day of Classes, Classes Follow a Friday Schedule |
| 5/4 | 28 | Review | |

IMPORTANT DATES

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|-----------------------|------------------|
| FIRST DAY OF SEMESTER | January 19, 2010 |
| MIDTERM EXAM | March 5, 2010 |
| LAST DAY TO WITHDRAW | March 29, 2010 |
| LAST DAY OF CLASSES | May 4, 2010 |
| FINAL EXAM PERIOD | May 6 – 12, 2010 |

Grading Policy

| Assignment Weighting | |
|----------------------|------|
| Homework | 25 % |
| MATLAB | 9 % |
| Midterm Exam | 33 % |
| Final Exam | 33 % |
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| Tentative Grading Scale | |
|-------------------------|-----------|
| A | 90 -- 100 |
| B+ | 85 -- 90 |
| B | 80 -- 85 |
| C+ | 75 -- 80 |
| C | 70 -- 75 |
| D | 60 -- 70 |
| F | 0 -- 60 |

Course Policies

Homework Assignments: Homework will be given in class.

MATLAB Assignments: Three MATLAB assignments will be given during the semester.

Important Departmental and University Policies

- [Academic Integrity Code is Strictly Enforced](#)
- [Prerequisites Requirements are Enforced](#)
- [Attendance is Required in Lower-Division Courses](#)
- [Exam Policies \(No Make Up Exams and More\)](#)
- [Cell Phone and Pager Use Prohibited in Class](#)
- [Drop Date \(March 29, 2009\) is Strictly Observed](#)
- [Complete DMS Course Policies \(math.njit.edu/students/undergraduate/policies_math\)](http://math.njit.edu/students/undergraduate/policies_math)

Prepared by Prof. Afkhami, January 4, 2010