

## VANDERBILT UNIVERSITY

### MATH 4110 – PARTIAL DIFFERENTIAL EQUATIONS

#### *Study guide for the first test*

The test will be on material covered until (including) the class of Sept 21. Below are topics and ideas that should be emphasized in your studies for the first test.

- Make sure you absolutely understand the difference between linear and non-linear equations.
- Know how to use the method of characteristics to solve first order PDEs.
- In the method of characteristics, know how to draw the characteristic curves.
- Understand the method of characteristics conceptually.
- Know how to reproduce the results established in class for Burger's equation.
- Know how to solve the Cauchy problem for the wave equation using D'Alembert's formula.
- For piece-wise initial data for the wave equation, know how to draw the different regions of influence and dependence as done in class.

Finally, make sure to review the class material available, in particular:

- Review the posted homework solutions.
- Review the posted class notes.
- No formula will be given in the exam. Memorize or know how to derive any formula that might be needed for the test (e.g., D'Alembert's formula).