COURSE DESCRIPTION
PARTIAL DIFFERENTIAL EQUATIONS I
MA 455/555 – 2D
FALL 2021

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Professor M. Nkashama
Office: UH 4033
Phone#: (205) 934-2154 (Math Dept)
E-mail: nkashama@uab.edu
Office Hours: Monday 11:00 AM – 1:00 PM (or by appointment)

Class Meeting times: TR 12:30 PM – 1:45 PM
Class Meeting location: UH 2007 (mask/face-covering during class required)
Credits: 3 semester hours
Textbook: *Applied Partial Differential Equations*, Third Edition, by J. David Logan, Springer, New York, 2015.
Topics to be covered can be found in Chapters 1 — 6.
Additional Resource: *Partial Differential Equations,* Second Edition, by Walter A. Strauss, John Wiley & Sons, Inc., New Jersey, 2008.

Important dates:

First day of class: August 23, 2021
Last day to drop/add without paying full tuition: August 30, 2021
Labor Day Holiday: September 06, 2021
Last day to withdraw from the course with a grade of "W": October 15, 2021
Fall/Thanksgiving Break: November 22 – 28, 2021
Last day of class: December 03, 2021
Major exams (tests): Test I: near Tuesday, October 05;
Test II: near Thursday, November 18;
(These dates are approximate and may be slightly shifted due to unforeseen circumstances.)
Final exam: Thursday, December 09, 2021, 10:45 AM – 1:15 PM. **The final exam is comprehensive!**

Date: August 16, 2021.

Course policies:

- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.
- If your are contacted by the Early Alert Program, you should consider taking advantage of the services it offers. Various services to assist you are also listed in the *Student Resources* sections of *CANVAS* and *BlazerNET* web sites.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.
- The two lowest homework grades will be dropped to account for any missed assignments due to illness or any other circumstance. If a test is missed due to a serious verifiable circumstance or official university business, the test grade will be replaced with the properly rescaled final exam score. You must advise the instructor of such circumstances **before** the exam takes place. A missed final exam gets a score of zero.
- Homework problems will be assigned regularly.

Methods of teaching and learning:

- Class meetings of 75 minutes consisting of lectures and discussions of examples and/or homework problems. Time for two in-class tests is also included.
- Students are expected to undertake at least 6 hours of private study and homework per week.

Course content:

- PDE Models (Conservation Laws, Diffusion, Vibrations and Acoustics, *Quantum Mechanics*, Classification of PDEs)
- PDEs on Unbounded Domains (Heat Equation, Wave Equation, Semi-infinite Domains, Laplace Transforms, Fourier Transforms)
- PDEs on Bounded Domains (Separation of Variables, Orthogonal Expansions, Fourier Series, Sturm-Liouville Problems, Laplace's Equation)
- Applications in Life Sciences (Traveling Waves Fronts, Equilibria and Stability)
- Some Numerical computation of solution (Heat and/or Laplace equations)

Assessment procedures:

- Student achievement will be assessed by the following measures:
  - **Homework.** Homework will be assigned regularly. Since the homework grade constitutes 20% of your course grade, it is strongly recommended that you attend classes on a regular basis and complete all homework assignments when due (no late homework/assignment will be accepted, for any reason).
  - **Two in-class tests** including short questions for which either full credit or no credit is awarded (Part I) as well as problems requiring in depth understanding (including word-problems) for which partial credit is awarded where appropriate. (Student(s) in **MA 555** will generally have additional questions.) Each test contributes 20% to the course average.
  - **A 150-minute comprehensive final examination** including Part I and Part II type problems. The final contributes 40% to the course average.

- Your course performance is your course average (including the final exam score). This is a number between 0 and 100.
- Your course grade is determined according to the following table:

Course performance:	90-100	80-89	65-79	50-64	below 50
Course Grade:	A	B	C	D	F

- In addition your course grade may be raised by a strong performance on the final exam (normally at most one letter grade).