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
Topics to be covered can be found in Chapters 1 — 6.

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 you 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:

<table>
<thead>
<tr>
<th>Course performance:</th>
<th>90-100</th>
<th>80-89</th>
<th>65-79</th>
<th>50-64</th>
<th>below 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Grade:</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

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