MATH 6361.90L Partial Differential Equations
SPRING 2019

Instructor: Dr. Anahit Galstyan
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Office hours: Tuesday, Thursday 4.30 pm – 5.30 pm or by appointment at EMAGC 3.714
Online Monday 1.00pm-2.00pm or by appointment

Textbook: No textbook is required, Lecture Notes will be posted on the Blackboard.

Recommended Textbooks:

Course Description: This course serves as a basic introduction to partial differential equations (PDEs). In this class, we shall examine the existence, uniqueness and the (quantitative and qualitative) properties of solutions to linear and nonlinear PDEs. Special attention will be placed on the three prototypical examples: the wave equation, the heat equation, and Laplace's equation. The course will cover the method of characteristics, Fourier series and the Fourier transform, separation of variables, initial and/or boundary value problems, Green's functions, maximum principles, potential theory and related integral equations, etc.

Prerequisite: MATH 3349 or consent of instructor

Homework: Homework will be assigned biweekly. The assignments will consist of problems and reading from the lecture notes. Completing the assignments on time is the single most important part of the course. It is strongly recommended that students work on all those problems. You must show work for every problem; a correct answer alone will not receive any credit.

Final Exam: Final exam is on Thursday, May 10, 5:45 p.m.-7:30 p.m. in the regular classroom.

Grading policy: The course grade will be based on
- HomeWorks and Quizzes (40%). Problems will be assigned, collected, and graded every 2 weeks. Quizzes will be based on HW problems.
- Project (20%).
- Midterm Exam (20%). A midterm exam, based on textbook reading and homework.
- Final Exam (20%). Also based on textbook reading and homework.
Grade Distribution:

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<thead>
<tr>
<th>90-100% : A</th>
<th>70-79% : C</th>
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<tbody>
<tr>
<td>80-89% : B</td>
<td>60-69% : D</td>
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<tr>
<td>0-59%: F</td>
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Calculators & Computers

The use of graphing/programmable calculators capable of performing basic graphing and numerical integration is strongly recommended. We may also need to use some computer software of your choice (MATLAB/MAPLE/MATHEMATICA) to do project problems.

Calendar of Activities

Some important dates for Spring 2019 include:

- **January 14** First day of class for full semester
- **January 17** Last day to add a class for spring 2017 semester
- **January 21** Martin Luther King Jr. Day - no classes
- **January 30** Census Day (last day to drop without it appearing on the transcript)
- **March 11 – 16** Spring Break, no classes
- **April 10** Last day to drop (DR grade) a class or withdraw (W grade)
- **April 19 – 20** Easter holiday, no classes
- **May 1** Last day of classes for full semester
- **May 2** Study Day, no classes
- **May 3 - 9** Final Exams
- **May 10 - 11** Commencement Ceremonies

Attendance of Online Office Hours

Every two-weeks attendance of online office hours is mandatory. Please, schedule an appointment.

Students with disabilities:

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Student Accessibility Services:

**Brownsville Campus:** Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

Mandatory Course Evaluations

Mandatory Course Evaluations Period (April 10 – May 1). Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); students will be contacted through
email with further instructions. **Students who complete their evaluations will have priority access to their grades.** Online evaluations will be available April 10 – May 1, 2019.

**Scholastic Integrity**

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:**

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at [www.utrgv.edu/equity](http://www.utrgv.edu/equity), including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination.

**Drop Policy**

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

**Student Services**

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Learning Center, Writing Center, Advising Center and Career Center. The
centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

- Learning center: BSTUN 2.10 (Brownsville) or ELCTR 100 (Edinburg)
- Writing center: BLIBR 3.206 (Brownsville) or ESTAC 3.119 (Edinburg)
- Advising center: BMAIN 1.400 (Brownsville) or ESWKH 101 (Edinburg)
- Career center: BCRTZ 129 (Brownsville) or ESSBL 2.101 (Edinburg)

**Student Learning Outcomes for the Masters Program:**

This course is required of students seeking either the M.S.-Mathematical Science or M.S.-Mathematics Teaching degree. By completing the masters program in mathematics at UTRGV, students will

P1. Demonstrate a sound conceptual understanding of mathematics through the construction of mathematically rigorous and logically correct proofs.

P2. Identify, formulate, and analyze real world problems with statistical and mathematical techniques.

P3. Demonstrate in-depth knowledge in either Mathematics Teaching or Mathematical Sciences.

P4. Utilize technology as an effective tool in investigating, understanding, and applying mathematics.

P5. Communicate mathematics effectively to mathematical and non-mathematical audiences in oral, written, and multi-media form.

P6. Demonstrate the ability to conduct research in mathematics or mathematics education.

P7. Demonstrate an appreciation of and enthusiasm for lifelong inquiry, learning, and creativity.

**Course Student Learning Outcomes:**

After completing this course students will

1. Carefully state and be able to apply the major definitions and theorems of modern theory of partial differential equations.

2. Understand the theory of second order partial differential equations and the qualitative properties of their solutions.

3. Understand the notation and language of partial differential equations and be able to apply the theory discussed to applied problems.