MATH 531 PARTIAL DIFFERENTIAL EQUATION

SPRING 2021
Schedule Number: 22306

COURSE INFORMATION

Class Days: MW
Class Times: 14:00-15:15

Class Location: zoom.us* (Live online classes)

Mode of Delivery: Live lectures, LAB, lecture videos

Instructor: Professor Uduak George
Instructor's Email: ugeorge@sdsu.edu
Instructor's Office Hours: MW 13:30-14:00; 15:15-15:45 or by appt.
Instructor's Office Hours Location: zoom.us*

*** Zoom link for live lectures and instructor's office hours is available on Canvas.**

ADDITIONAL COURSE INFORMATION

I'll try to respond to emails within 2 working days, my email is ugeorge@sdsu.edu. For quick questions, the turnaround time may be much shorter. For questions that involve, say, the clarification of course concept, you may want to meet during office hours (see above for days and time for office hours).

Homework will be posted on the Assignment tab on the course page on Canvas (https://canvas.sdsu.edu).
Homework and exam grades will be posted on Canvas
Course notes will be posted on Canvas.

COURSE DESCRIPTION

Boundary value problems for heat and wave equations: eigenfunction expansions, Sturm-Liouville theory and Fourier series. D'Alembert's solution to wave equation; characteristics. Laplace's equation, maximum principles, Bessel functions.

ENROLLMENT INFORMATION

Prerequisites: Mathematics 252 and 337 with a grade of C (2.0) or better in each course or Instructor's permission

COURSE MATERIAL

REQUIRED TEXT: APPLIED PARTIAL DIFFERENTIAL EQUATIONS (WITH FOURIER SERIES AND BOUNDARY VALUE PROBLEMS) BY RICHARD HABERMAN, PEARSON 2013. ISBN 9780321797056.

PROGRAMMING:

We will use MATLAB in the class. Students will be allowed to use other programming languages if they choose to.

Student Learning Outcomes

- Students will be able to connect significant physical problems with PDEs.
- Students will be able to solve PDEs.
- Students will be able to visualize the solution for PDEs through programming.
- Students will be able to manage the methods and details for large multi-step problems.
- Students will explore decomposition of continuous functions with Fourier series.
- Students will develop an appreciation for the complexities and varied techniques for PDEs

Course Assessment and Grading

- Your final score will consist of homework (34%), two exams (42%) and final exam (24%).
- Homework Policy: Any homework that is more that 3 days late but not more than 7 days late will be worth 80%. Any homework that is more than 7 days late will not be graded unless you make arrangement with me in advance.
- Homework will be submitted via Canvas.
- Take-home Exams submitted after the deadline will be worth 80%. Any Exam that is more than 7 days late will not be graded unless you make arrangement with me in advance.
- Do not allow someone else to copy your work. If you suspect a student of cheating please inform me. The Mathematics and Statistics Department expects academic honesty from our students, as laid out in the University Policies below. Violations will be reported to the Center for Student Rights and Responsibilities.
- Attendance to all lectures is required.
- The following grading scale will be used:

A 93% - 100%	A- 90% - 92.9%			
B+ 87% - 89.9%	B 83% - 86.9%	B- 80% - 82.9%		
C+ 76% - 79.9%	C 72% - 75.9%	C- 68% - 71.9%		
D+ 64% - 67.9%	D 60% -63.9%	D- 55% - 59.9%	F Below 55%	

Tentative Course Schedule

WK	Dates	Schedule	HW, Exams and Readings
1	Jan 20– 22	Course Overview; Introduction HW 1 Assigned	Read Chapters 1 and 2
2	Jan 25 –29	Ordinary Differential Equations and Heat Equation – Derivation. HW 2 Assigned	Read Chapters 2 and 3 HW 1 Due 01/29
3	Feb 1 – 5	Separation of Variables and Fourier Series HW 3 Assigned	Read Chapters 2 and 3 HW 2 Due 02/05
4	Feb 8 – 12	Fourier series **Friday Feb 12th: Rest and recovery day***	Read Chapter 4 HW 3 Due 02/11 This week HW is due on Thursday
5	Feb 15 – 19	Vibrating String and Sturm-Liouville Problems HW 4 Assigned	Read Chapter 4 and Chapter 5
6	Feb 22 – 26	Sturm-Liouville Problems HW 5 Assigned	Read Chapter 4 and Chapter 5 HW 4 Due 02/26
7	Mar 1 – 5	Heat Equation - 3D, higher dimensional PDEs. **Monday Mar 8th: Rest and recovery day*** HW 6 Assigned	Read Chapter 7 HW 5 Due 03/05
8	Mar 8 – 12	Method of Frobenius and Bessel's Differential Equation. **Take Home Exam 1 Assigned**	HW 6 Due 03/12
9	Mar 15 – 19	Bessel's Differential Equation and Spherical Problems. HW 7 Assigned	**Take Home Exam 1 Due 03/19** Exam submitted after 03/19 will be worth 80%

10	Mar 22 – 26	Legendre Polynomials **Tuesday Mar 30th: Rest and recovery day*** **Wednesday Mar 31st: Holiday-Cesar Chavez Day** HW 8 Assigned	Read Chapter 8 HW 7 Due 03/26
11	Mar 29 – Apr 2	Nonhomogeneous Problems. HW 9 Assigned	Read Chapter 8 HW 8 Due 04/02
12	Apr 5 – 9	Nonhomogeneous problems. **Thursday Apr 15th: Rest and recovery day*** **Take Home Exam 2 Assigned**	Read Chapter 10 HW 9 Due 04/09
13	Apr 12 – 16	Fourier Transforms. HW 10 Assigned	Read Chapter 10 **Take Home Exam 2 Due 04/16**
14	Apr 19 – 23	Fourier Transforms. HW 11 Assigned	Read Chapter 12 HW 10 Due 04/23
15	Apr 26 – 30	Method of Characteristics.	HW 11 Due 04/30
16	May 3 – 7	May 5th: Last day of classes 05/03- **Take Home Final Assigned**	**Take Home Final** due at 15:00PM on May 10th in Canvas Exam submitted after the due date will be worth 80%
	May 21	Last day of Spring semester. Grades due from instructors.	

***Rest and recovery days** are specifically designated for no instruction, no assignments, no deadlines, and no exams. Office hours, meetings and committee obligations will also be suspended during each rest and recovery day.

Classroom Conduct Standards

SDSU students are expected to abide by the terms of the Student Conduct Code in classrooms and other instructional settings. Prohibited conduct includes:

- Willful, material and substantial disruption or obstruction of a University-related activity, or any on-campus activity.
- Participating in an activity that substantially and materially disrupts the normal operations of the University or infringes on the rights of members of the University community.
- Unauthorized recording or dissemination of virtual course instruction or materials by students, especially with the intent to disrupt normal university operations or facilitate academic dishonesty. This includes posting of exam problems or questions to on-line platforms.
- Conduct that threatens or endangers the health or safety of any person within or related to the University community, including
    1. physical abuse, threats, intimidation, or harassment.
    2. sexual misconduct.

Violation of these standards will result in referral to appropriate campus authorities.

Academic Honesty

The University adheres to a strict policy prohibiting cheating and plagiarism. Examples of academic dishonesty include but are not limited to:

- copying, in part or in whole, from another's test or other examination;
- obtaining copies of a test, an examination, or other course material without the permission of the instructor;
- collaborating with another or others in work to be presented without the permission of the instructor;
- falsifying records, laboratory work, or other course data;
- submitting work previously presented in another course, if contrary to the rules of the course;
- altering or interfering with grading procedures;
- assisting another student in any of the above;

- using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work);
- copying and pasting work from an online or offline source directly and calling it your own;
- using information you find from an online or offline source without giving the author credit;
- replacing words or phrases from another source and inserting your own words or phrases.

The California State University system requires instructors to report all instances of academic misconduct to the Center for Student Rights and Responsibilities. Academic dishonesty will result in disciplinary review by the University and may lead to probation, suspension, or expulsion. Instructors may also, at their discretion, penalize student grades on any assignment or assessment discovered to have been produced in an academically dishonest manner.

Students with Disabilities

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Ability Success Center at (619) 594-6473. You can also learn more about the services provided by visiting the Student Ability Success Center website. To avoid any delay in the receipt of your accommodations, you should contact Student Ability Success Center as soon as possible. Please note that accommodations are not retroactive, and I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Ability Success Center.

Student Privacy and Intellectual Property

The Family Educational Rights and Privacy Act (FERPA) mandates the protection of student information, including contact information, grades, and graded assignments. I will not post grades or leave graded assignments in public places. Students will be notified at the time of an assignment if copies of student work will be retained beyond the end of the semester or used as examples for future students or the wider public. Students maintain intellectual property rights to work products they create as part of this course unless they are formally notified otherwise.

Religious Observances

According to the University Policy File, students should notify the instructors of affected courses of planned absences for religious observances by the end of the second week of classes.

Medical-related absences

Medical-related absences: Students are instructed to contact their professor/instructor/coach in the event they need to miss class, etc. due to an illness, injury or emergency. All decisions about the impact of an absence, as well as any arrangements for making up work, rest with the instructors. Student Health Services (SHS) does not provide medical excuses for short-term absences due to illness or injury. When a medical-related absence persists beyond five days, SHS will work with students to provide appropriate documentation. When a student is hospitalized or has a serious, ongoing illness or injury, SHS will, at the student's request and with the student's consent, communicate with the student's instructors via the Vice President for Student Affairs and may communicate with the student's Assistant Dean and/or the Student Ability Success Center.

Turnitin

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. You may submit your papers in such a way that no identifying information about you is included. Another option is that you may request, in writing, that your papers not be submitted to www.turnitin.com. However, if you choose this option you will be required to provide documentation to substantiate that the papers are your original work and do not include any plagiarized material.

COPYRIGHT POLICY

SDSU respects the intellectual property of others and we ask our faculty & students to do the same. It is best to assume that any material (e.g., graphic, html coding, text, video, or sound) on the Web is copyrighted unless specific permission is given to copy it under a Creative Commons License. More information about the use of copy written material in education as part of the TEACH Act and Copyright Fair Use Guidelines. Whenever possible, you should attribute the original author of any work used under these provisions.

SDSU ECONOMIC CRISIS RESPONSE TEAM

SDSU Economic Crisis Response Team: If you or a friend are experiencing food or housing insecurity, or any unforeseen financial crisis, visit http://sdsu.edu/ecrt, email ecrt@sdsu.edu, or walk-in to Well-being & Health Promotion on the 3rd floor of Calpulli Center.

RESOURCES FOR STUDENTS

A complete list of all academic support services--including the Writing Center and Math Learning Center--is available on the Student Affairs' Academic Success website. Counseling and Psychological Services (619-594-5220) offers confidential counseling services by licensed therapists; you can Live Chat with a counselor at http://go.sdsu.edu/student_affairs/cps/therapist-consultation.aspx between 4:00pm and 10:00pm, or call San Diego Access and Crisis 24-hour Hotline at (888) 724-7240.