# Purdue Logo

# Course Information

MA 520 Boundary Value Problems Of Differential Equations

Meeting time: TTh 9:00-10:15 **in WTHR 104**

Course web page/Brightspace: [www.math.purdue.edu/~](https://www.math.purdue.edu/~brown00/266-F20.html)eremenko/520.html

Prerequisites: Multivariate **Calculus, Linear Algebra, Ordinary Differential equations**

# Instructor Information

Instructor: **Professor Alex Eremenko**

Office: **MATH 600**

Phone: **494-1975**

Email Address: eremenko**@purdue.edu**

Office hours: **e-mail and appointment**

# Course Description

**Equatiobns of Mathematical Physics: Laplace, Heat, Wave abd Schrodinger equations.**

**Superposition Principle. Boundary value problems. Separation of variables. Fourier series.**

**Eigenvalues and eigenfunctions of differential operators. Special functions: Bessel, Legendre,**

**Hermite and Laguerre functions. Fourier transform. Distributions.**

Learning Outcomes

**By the end of the course, you will be able to:**

**Apply Harmonic Analysis to solving wide range of boundary value**

**problems for linear partial differential equations of mathematical physics.**

How to Succeed in this Course

**To be a successful student:**

* **Read the textbook and handouts**
* **Be self-motivated and self-disciplined**
* **Be willing and able to commit the appropriate number of hours per week to course**
* **Do all assignments diligently and consistently**
* **Ask questions, in class or by e-mail.**

**Common behaviors that lead to failing the course:**

* **Not reading or looking at text until assignments are due**
* **Waiting until the last day to begin assignments**
* **Missing or forgetting deadlines**
* **Not studying for exams**
* **Ignoring course emails and annoucements**
* **Not taking course material seriously**

# Learning Resources, Technology, & Texts

* Required Textbook: G. Folland, Fourier Analysis and its applications,
* Additional Material: **will be posted on the course page**
* BRIGHTSPACE Page: https://purdue.brightspace.com/d2l/home/216030

# Course Logistics

* **The online homework must be submitted through Brightspace. The deadlines are displayed there for each assignment.**
* **General course ground rules for all sections are listed here:** [**General Course Ground Rules**](https://www.math.purdue.edu/academic/files/courses/2020spring/MA26600/266GroundRule.pdf)

# Instructor’s Face-to-Face Office Hours

**By Appointment**

# Instructor’s Email Availability and Policies

**You may email me at any time.**

# Virtual Office Hours

**TBD**

# Assignments and Points

* **Your learning will be assessed through a combination of homework assignments, midterm exam, and a comprehensive course-wide final exam. Details will be posted on the course web page.**
* **Here is a schedule and list of due dates: Midterm exam is on March 2, in class. Homework is due every week, on Tuesday.**

# Missed or Late Work

**Missed or late assignments can only be made up when you notify me ahead of time with a reasonable explanation and plan for completion. These requests will be accepted at my discretion. Asking for an extension does not guarantee it will be granted.**

# Grading Scale

* **The grading procedure for this course is explained on the course page https://www.math.purdue.edu/~eremenko/generalf.html**

# Incompletes

**For the official policy on incompletes (as well as other matters related to grading) see the** [**Grades and Grade reports webpage**](https://www.purdue.edu/studentregulations/regulations_procedures/grades.html)**. A grade of incomplete (I) will be given only in unusual circumstances. To receive an “I” grade, a written request must be submitted prior to May 8, and approved by the instructor. The request must describe the circumstances, along with a proposed timeline for completing the course work. Submitting a request does not ensure that an incomplete grade will be granted. If granted, you will be required to fill out and sign an “Incomplete Contract” form that will be turned in with the course grades. Any requests made after the course is completed will not be considered for an incomplete grade.**

# Course Schedule

* **Complete Course Schedule available here: https://www.math.purdue.edu/~eremenko/520.html**
* **The official last day of class is April 15, 2021.**
* **Grades are due by 5:00 pm, May 11, 2021.**
* **Final exam will be announced.**

# Key University Dates:

* **Classes begin on January 19, 2021.**
* **Last day to cancel a class without it appearing on your transcript is February 1, 2021**
* **Last day to withdraw from a course with a W or WF is February 12, 2021.**

# Attendance Policy

**Attendance is not taken. I expect those students who are able, and choose to attend, will come to class to get the full experience of interacting with me and their peers. However, in these uncertain times, I completely understand if a student chooses to not attend for whatever reason they deem reasonable and he/she will not be penalized. In cases of bereavement, the student or the student’s representative should contact the Office of the Dean of Students via** [**email**](mailto:odos@purdue.edu ?subject=Student Bereavement Needs) **or phone at 765-494-1747.**

# Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either [emailing](mailto:integrity@purdue.edu?subject=Academic Integrity Issue) or by calling 765-494-8778.  While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

The [Purdue Honor Pledge](https://www.purdue.edu/odos/osrr/honor-pledge/about.html) “As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue"

Purdue's [student guide for academic integrity](https://www.purdue.edu/odos/osrr/academic-integrity/index.html).

# Nondiscrimination Statement

*Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.* [*Link to Purdue’s nondiscrimination policy statement*](http://www.purdue.edu/purdue/ea_eou_statement.html)*.*

# Students with Disabilities

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: [**drc@purdue.edu**](mailto:drc@purdue.edu) or by phone: 765-494-1247.

# Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

*Guidelines regarding ensuring access to emergency information:*

* *Keep your cell phone on to receive a Purdue ALERT text message.*
* *Log into a Purdue computer connected to the network to receive any Desktop Popup Alerts.*
* *If you have a “no cell phone” in class policy allow one or two students who have signed up for Purdue ALERT to keep their phones on to receive any alerts*

# Mental Health Statement

Recommendations from the University Senate, CAPS and the Dean of Students:

* **If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try** [**WellTrack**](https://purdue.welltrack.com/)**.** Sign in and find information and tools at your fingertips, available to you at any time.
* **If you need support and information about options and resources**, please see the [Office of the Dean of Students](http://www.purdue.edu/odos) for drop-in hours (M-F, 8 am- 5 pm).
* **If you’re struggling and need mental health services**: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services (CAPS)](https://www.purdue.edu/caps/) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

# Netiquette

This semester will be unlike others in your experience. Much of your work and communications will be conducted over the internet. We wish to foster a safe online learning environment and working as a community of learners, we can together build a polite and respectful course ambience. Please read the Netiquette guidelines for this course:

* Be respectful of others.
* Do not dominate any discussions and/or office hours. Give other students an opportunity to join in.
* Do not use offensive language.
* Be cautious in using Internet language. For example, do not capitalize all letters since this suggests shouting.
* Reread your email message for possible edits before you hit the “Send” button.
* Keep your email message focused.

# Violent Behavior Policy

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity.

See the [University’s full violent behavior policy](https://www.purdue.edu/policies/facilities-safety/iva3.html) for more detail.

# Diversity and Inclusion Statement

**In all academic discourse, including mathematics, diversity is an asset, and we need to encourage and respect differences. Please speak with me, anonymously if needed, if something has made you uncomfortable. Intention and impact are not always aligned, and we should respect the impact something may have on someone even if it was not the speaker’s intention. We all come to the class with a variety of experiences and a range of expertise, we should respect these in others while critically examining them in ourselves. You will learn more from each other than you will learn from me, and I hope you’ll welcome that in our exchanges.**

# Course Evaluation

**During the last two weeks of the course, you will be provided with an opportunity to evaluate this course and your instructor. Purdue uses an online course evaluation system. You will receive an official email from evaluation administrators with a link to the online evaluation site. You will have up to two weeks to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.**

# Disclaimer

**This syllabus is subject to change. Please check with the general course web page as well as my personal section webpage for changes and updates as the semester progresses.**