



MA42800 Introduction to Fourier Analysis

PURDUE UNIVERSITY | SPRING 2022

Course Info

Section: 001 (CRN 10703)

Time and Place: MWF 1:30–2:20P in REC 122

Course Web Page: <https://www.math.purdue.edu/~arshak/ma428>

Instructor: Arshak Petrosyan

Contact: arshak@purdue.edu

Office Hours: MWF 11:30–12:30P, or by appointment, in MATH 836

Textbook: [Stein-Shakarchi] Elias M. Stein and Rami Shakarchi, *Fourier Analysis. An Introduction*, Princeton University Press, Princeton, NJ, 2003

Course Description: Syllabus is essentially the first six chapters in [Stein-Shakarchi]:

1. The Genesis of Fourier Analysis
2. Basic Properties of Fourier Series
3. Convergence of Fourier Series
4. Some Applications of Fourier Series
5. The Fourier Transform on \mathbb{R}
6. The Fourier Transform on \mathbb{R}^d (excluding the higher dimensional wave equation)

Particular topics include: Fourier series, uniqueness, convolutions, good kernels, Cesaro and Abel summation, Fejer and Poisson kernels, Parseval's identity, Fourier transform, Schwarz class, Gaussian kernels, Plancherel's identity, Poisson summation formula, Radon transform; applications to the wave, heat, and Laplace equations, the isoperimetric inequality, equidistribution theorems.

Homework: There will be weekly homework assignments to be collected through [Gradescope](#), typically due at 11:59pm on Fri. No late homeworks will be accepted, however the lowest homework score will be dropped. For more information, see [Homework](#) page.

Exams: There will be two midterm exams and a final, most likely in take-home format. The exact information will be posted on the [Exams](#) page at least two weeks in advance.

Grading: Your homework and exam scores will be available in [Gradescope](#) and [Brightspace](#). Your final score will be calculated as the maximum of scores obtained by the two schemes

$$\begin{aligned} \text{Scheme I} &= (3/10)ME1 + (3/10)ME2 + (1/5)FE + (1/5)HW, \\ \text{Scheme II} &= (3/8)ME1 + (3/8)ME2 + (1/4)HW, \end{aligned}$$

where FE, ME_i, HW are the scores (in %) for Final Exam, Midterm Exam *i*, Homework, respectively. Thus, you have an option to skip the final exam.

Grade cutoffs: Students who get at least 97% of the total points in this course are guaranteed an A+, 93% guarantees an A, 90% an A-, 87% a B+, 83% a B, 80% a B-, 77% a C+, 73% a C, 70% a C-, 67% a D+, 63% a D, and 60% a D-; for each of these grades, it is possible that at the end of the semester a lower percentage will be enough to get that grade.

Academic Integrity: As a reminder, all students must comply with Purdue's policy for academic integrity:

<https://www.purdue.edu/odos/academic-integrity/>

Students with Disabilities: Purdue University strives to make learning experiences accessible to all participants. 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 or by phone at 765-494-1247.

If you have been certified by the Disability Resource Center (DRC) as eligible for accommodations, you should contact your instructor to discuss your accommodations as soon as possible. Here are instructions for sending your Course Accessibility Letter to your instructor:

<https://www.purdue.edu/drc/students/course-accessibility-letter.php>

Classroom Guidance Regarding Protect Purdue: Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the [Office of the Student Rights and Responsibilities](#). See also [Purdue University Bill of Student Rights](#) and the Violent Behavior Policy under University Resources in Brightspace.

Academic Guidance in the Event a Student is Quarantined/Isolated: If you must miss class at any point in time during the semester, please reach out to me via email so that we can communicate about how you can maintain your academic progress. If you find yourself too sick to progress in the course, notify your adviser and notify me via email. We will make arrangements based on your particular situation. Please note that, according to [Details for Students on Normal Operations for Fall 2021](#) announced on the Protect Purdue website, "individuals who test positive for COVID-19 are not guaranteed remote access to all course activities, materials, and assignments."

Emergencies: 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 instructor via email or phone. You are expected to read your @purdue.edu email on a frequent basis.