

This homework is due at 11 PM on January 19, 2024.

Submission Format: Your homework submission should consist of a single PDF file that contains all of your answers (any handwritten answers should be scanned).

1. Course Setup

Please complete the following steps to get access to all course resources.

- (a) Visit the course website at <http://eecs127.github.io/> and familiarize yourself with the syllabus.
- (b) Verify that you can access the class Ed site at <https://edstem.org/us/courses/52173>.
- (c) Verify that you can access the class Gradescope site at <https://www.gradescope.com/courses/699270>.
- (d) When are self grades due for this homework? In general, when are self grades due? Where are the self-grade assignments?
- (e) How many homework drops do you get? Are there exceptions?

2. What Prerequisites Have You Taken?

The prerequisites for this course are

- EECS 16A & 16B (Designing Information Devices and Systems I & II) **OR** MATH 54 (Linear Algebra & Differential Equations),
- CS 70 (Discrete Mathematics & Probability Theory), and
- MATH 53 (Multivariable Calculus).

Please fill out the following Google form: <https://forms.gle/nnQrTC2EjdEAAkP49> to tell us which of these courses, or their equivalents, you have taken. If you are unsure of course material overlap, please refer to the EECS 16A, EECS 16B, and CS 70 websites (<https://www.eecs16a.org/>, <https://www.eecs16b.org/>, and <http://www.sp22.eecs70.org/>, respectively) and the MATH 53 textbook (*Multivariable Calculus* by James Stewart). **For the response to this question, write the secret word revealed at the end of the form.**

The course material this semester will rely on knowledge from these prerequisite courses. If you feel shaky on this material, please use the first week to reacquaint yourself with it. We expect you to handle this review on your own; we will not prioritize questions about prerequisite material in office hours.

3. Orthogonality

Let $\vec{x}, \vec{y} \in \mathbb{R}^n$ be two linearly independent unit-norm vectors; that is, $\|\vec{x}\|_2 = \|\vec{y}\|_2 = 1$.

- (a) Show that the vectors $\vec{u} = \vec{x} - \vec{y}$ and $\vec{v} = \vec{x} + \vec{y}$ are orthogonal.
- (b) Find an orthonormal basis for $\text{span}(\vec{x}, \vec{y})$, the subspace spanned by \vec{x} and \vec{y} .

4. Homework Process

With whom did you work on this homework? List the names and SIDs of your group members.

NOTE: If you didn't work with anyone, you can put "none" as your answer.