

# EE 325 Probability and Random Processes

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# Course Details

- Instructor** Saravanan Vijayakumaran
- Office** EE 122B (Opposite PC lab)
- Schedule** Slot 5, Wednesday and Friday
- Location** EEG 401, Collaborative Classroom (may change)
- Webpage** <http://www.ee.iitb.ac.in/~sarva/courses/EE325/Spring2025.html>

# Syllabus

- Probability Spaces
- Random Variables
- Limit Theorems
- Random Processes

**Detailed syllabus:** Sets and set operations; Probability space, Conditional probability and Bayes theorem, Combinatorial probability and sampling models, Discrete random variables, probability mass function, probability distribution function, example random variables and distributions, Continuous random variables, probability density function, probability distribution function, example distributions, Joint distributions, functions of one and two random variables, moments of random variables, Conditional distribution, densities and moments, Characteristic functions of a random variable, Markov, Chebyshev and Chernoff bounds; Random sequences and modes of convergence (everywhere, almost everywhere, probability, distribution and mean square), Limit theorems, Strong and weak laws of large numbers, central limit theorem. Random process. Stationary processes. Mean and covariance functions. Ergodicity. Transmission of random process through LTI. Power spectral density.

# Reference Books

- *Probability and Random Processes*, G. Grimmett and D. R. Stirzaker, 2020 (4th Edition)
- *Elementary Probability for Applications*, R. Durrett, 2009
- *One Thousand Exercises in Probability*, G. Grimmett and D. R. Stirzaker, 2020 (3rd Edition)

# Grading Policy

- Relative grading
- No audits
- Assignments 10%
- Two quizzes 10% + 10%
- Midsem 30%
- Endsem 40%

## Attendance Requirement

- DX grade for insufficient attendance
- Attendance will be taken in each lecture and uploaded on Moodle
- 80% attendance required
- Number of lectures = 26
- $26 \times 0.8 = 20.8 \approx 21$
- You can miss at most 5 lectures

Thanks for your attention