



Probability and Stochastic Processes

Course Code: AI5030 (Cross-Listed with EE5817)

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What to Expect?

- Rigorous mathematical exposition of the axiomatic theory of probability
- In-depth understanding of random variables and probability distributions
- Theory of Markov chains and Poisson processes
- Formal mathematical proofs (without letting them obfuscate the main ideas)

Schema for Grading

- Weekly homework
- One quiz question (5 points) based on the homework
- Quiz duration: 30 minutes
- 6 quizzes; 4 best scores will be considered

Quizzes	20%
Mid-Term 1	20%
Mid-Term 2	20%
Final Exam	40%

Timeline

Week	No of Lectures
29 Jul – 02 Aug	2
05 Aug – 09 Aug	2
12 Aug – 16 Aug	1 (Independence Day)
19 Aug – 23 Aug	2
26 Aug – 30 Aug	2
02 Sep – 06 Sep	2
09 Sep – 13 Sep	2
16 Sep – 20 Sep	1 (Eid-e-Milad)
23 Sep – 27 Sep	2

quiz

midterm

- Mid-term 1: 21 Sep (Saturday),
14:30-16:00

Week	No of Lectures
30 Sep – 04 Oct	2
07 Oct – 11 Oct	0 (mid-semester break)
14 Oct – 18 Oct	2
21 Oct – 25 Oct	2
28 Oct – 01 Nov	1 (Diwali)
04 Nov – 08 Nov	2
11 Nov – 15 Nov	2
18 Nov – 22 Nov	2
25 Nov – 29 Nov	1 (last lecture)

- Mid-term 2: 16 Nov (Saturday),
14:30-16:00
- Final exam: 28 Nov (Thursday),
14:30-17:30

References

For Engineers

- G. Grimmett & D. Stirzaker. *Probability and Random Processes*.
- Sheldon M. Ross. *A First Course in Probability*
- Anurag Kumar. *Discrete Event Stochastic Processes*
- Jean Jacod & Philip Protter. *Probability Essentials*

For Math Buffs

- A. N. Kolmogorov. *Foundations of the Theory of Probability*
- Shiryaev A. N. *Probability-1*
- H. L. Royden and P. M. Fitzpatrick. *Real Analysis*
- W. Feller. *An Introduction to Probability Theory and its Applications*
- P. Billingsley. *Probability and Measure*

Other Useful References

- *Probability Foundations for Electrical Engineers*.
NPTEL lectures by Prof. Krishna Jagannathan, IIT Madras
- Prof. B. V. Rao's *notes* on measure-theoretic probability.
See also his wonderful compilation of exercises *here*
- Prof. Manjunath Krishnapur's *course* on probability taught at IISc

The Team

Name	Email	Office Hours	Day
Karthik P. N. (instructor)	pnkarthik@ai.iith.ac.in	16:00-17:00	Thu
Akshintala Venkata Mahvith Kusumakar	ai23mtech12003@iith.ac.in	16:00-17:00	Wed
Piyushi Manupriya	cs18m20p100002@iith.ac.in	18:30-19:30	Fri
Siddharth Shrivastava	ai24resch01002@iith.ac.in	18:00-19:00	Tue
Rutv Kocheta	ma21btech11014@iith.ac.in	–	–