


PROBABILITY FOUNDATIONS FOR ELECTRICAL ENGINEERS

PROF. ANDREW THANGARAJ
Department of Electrical and Electronics Engineering
IITM

PROF. ARAVIND EE
Department of Electrical and Electronics Engineering
IITM

TYPE OF COURSE : Rerun | Core/Elective | UG/PG
COURSE DURATION : 12 Weeks (18 Jan' 21 - 09 Apr' 21)
EXAM DATE : 25 Apr 2021

PRE-REQUISITES : Basic calculus

INTENDED AUDIENCE : Any interested Learners

INDUSTRIES APPLICABLE TO : This course is not directly relevant to industries. It is a fundamental course in probability.

COURSE OUTLINE :

This course will introduce the basic foundational aspects of probability theory primarily to an electrical engineering audience. In communications, signal processing and networking applications, probability theory and models play a vital role in design and implementation. This course will prepare a student to take courses such as Digital/Wireless Communications, Adaptive Signal Processing and Communication Networks.

ABOUT INSTRUCTOR :

Andrew Thangaraj received his B.Tech in Electrical Engineering from the Indian Institute of Technology (IIT), Madras, India in 1998 and a PhD in Electrical Engineering from the Georgia Institute of Technology, Atlanta, USA in 2003. He was a post-doctoral researcher at the GTL-CNRS Telecom lab at Georgia Tech Lorraine, Metz, France from August 2003 to May 2004. From June 2004, he has been with the Department of Electrical Engineering, IIT Madras, where he is currently a professor. Since Jan 2012, he has been serving as Editor for the IEEE Transactions on Communications. Since Oct 2011, he has been serving as NPTEL coordinator at IIT Madras. He has played a key role in initiating and running NPTEL online courses and certification. He is currently a National MOOCs Coordinator for NPTEL in the SWAYAM project of the MHRD.

R Aravind is a faculty member in the Department of Electrical Engineering at the Indian Institute of Technology Madras. Aravind has a PhD in electrical engineering from the University of California, Santa Barbara. His research interests include image and video processing and compression.

COURSE PLAN :

Week 1: Probability space

Week 2: Conditional probability

Week 3: Independence

Week 4: Discrete random variables

Week 5: Conditional and joint distributions

Week 6: Independent random variables, functions of two random variables

Week 7: Continuous random variables

Week 8: Jointly distributed random variables

Week 9: Transformations of random variables, Expectations

Week 10: Expectation, Variance and Correlation

Week 11: Conditional Expectation

Week 12: Law of large numbers