COURSE DETAIL

FOURIER ANALYSIS AND STATISTICS
Country United Kingdom - Scotland
Host Institution University of Edinburgh
Program(s) University of Edinburgh
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Statistics Physics
UCEAP Course Number 131
UCEAP Course Suffix
UCEAP Official Title FOURIER ANALYSIS AND STATISTICS
UCEAP Transcript Title FOURIER ANALYS&STAT
UCEAP Quarter Units 8.00
UCEAP Semester Units 5.30

Course Description

Topics include Fourier analysis: Fourier series, Fourier transform, Dirac delta function, sifting property, Fourier representation, convolution, correlations, Parseval's theorem power spectrum, sampling; Nyquist theorem, data compression, solving ordinary differential equations with Fourier methods, driven damped oscillators, Green's functions for 2nd order ODEs, partial differential equations, PDEs and curvilinear coordinates, Bessel functions, and Sturm-Liouville theory. Topics for probability and statistics include concept and origin of randomness, randomness as frequency and as degree of belief, discrete and continuous probabilities, combining probabilities, Bayes theorem, probability distributions and how they are characterized, moments and expectations, error analysis, permutations, combinations, and partitions, Binomial distribution, Poisson distribution, the Normal or Gaussian distribution, shot noise and waiting time distributions, resonance and the Lorentzian, growth and competition and power-law distributions, hypothesis testing, parameter estimation, Bayesian inference, correlation and covariance, and model fitting.

Language(s) of Instruction
English

Host Institution Course Number
PHYS09055

Host Institution Course Title
FOURIER ANALYSIS AND STATISTICS

Host Institution Course Details
http://www.drps.ed.ac.uk/22-23/dpt/cxphys09055.htm

Host Institution Campus
Edinburgh

Host Institution Faculty

Host Institution Degree

Host Institution Department
School of Physics and Astronomy

Course Last Reviewed
2022-2023

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