

Descriptive List of Upper Division Statistics and Math Coursework

Hubert Luo

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All the following courses were at the University of California, Berkeley.

Completed Courses

Math 104: Introduction to Analysis

- Grade: A
- Instructor: Michael Pejic
- Text Used: Kenneth A. Ross, *Elementary Analysis: The Theory of Calculus*
- Subject Matter: The real number system. Sequences, limits, and continuous functions in \mathbb{R} and \mathbb{R}^n . Metric spaces. Uniform convergence, interchange of limit operations. Infinite series. Mean value theorem and applications. The Riemann integral.

Stat 134: Concepts of Probability

- Grade: A+
- Instructor: Hank Ibser
- Text Used: Jim Pitman, *Probability*
- Subject Matter: Conditional expectation, independence, laws of large numbers. Discrete and continuous random variables. Central limit theorem. The Poisson process, Markov chains, characteristic functions.

Stat 135: Concepts of Statistics

- Grade: A+
- Instructor: Hank Ibser
- Texts Used: John A. Rice, *Mathematical Statistics and Data Analysis* and Deborah Nolan, *Stat Labs: Mathematical Statistics through Applications*
- Subject Matter: Statistical theory and methodology. Descriptive statistics, maximum likelihood estimation, non-parametric methods, Optimality, goodness-of-fit tests, analysis of variance, bootstrap and computer-intensive methods and least squares estimation.

Math 110: Linear Algebra

- Grade: A
- Instructor: Zvezdelina Stankova
- Text Used: Stephen H. Friedberg, *Linear Algebra*

- Subject Matter: Matrices, vector spaces, linear transformations, inner products, determinants. Eigenvectors. QR factorization. Quadratic forms and Rayleigh's principle. Jordan canonical form, applications. Linear functionals.

Math 113: Abstract Algebra

- Grade: A+
- Instructor: Alexander Paulin
- Text Used: Alexander Paulin, *Course Notes* ([Link](#))
- Subject Matter: Sets and relations. The integers, congruences and the Fundamental Theorem of Arithmetic. Groups and their factor groups. Commutative rings, ideals and quotient fields. The theory of polynomials: Euclidean algorithm and unique factorizations. The Fundamental Theorem of Algebra. Fields and field extensions.

Stat 133: Concepts in Computing with Data

- Grade: A+
- Instructor: Gaston Sanchez
- [Link to GitHub Site](#)
- Subject Matter: Computationally intensive applied statistics. Data manipulation (wrangling, reshaping, tidying). Visualization and graphics. Programming concepts. Data technologies and reporting tools. Dynamic documents.

Computer Science 188: Artificial Intelligence

- Grade: A+
- Instructors: Anwar Baroudi and Daniel Fried
- Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*
- Subject Matter: Ideas and techniques underlying the design of intelligent computer systems. Search, game playing, knowledge representation, inference, planning, reasoning under uncertainty, machine learning, robotics, perception, and language understanding.

Current Courses**Stat 150: Stochastic Processes**

- Grade: In Progress
- Instructor: Brett Kolesnik
- Text Used: Mark A. Pinsky and Samuel Karlin, *An Introduction to Stochastic Modeling*
- Subject Matter: Random walks, discrete time Markov chains, Poisson processes. Further topics such as: continuous time Markov chains, queueing theory, point processes, branching processes, renewal theory, stationary processes, Gaussian processes.

Stat 151A: Linear Modelling

- Grade: In Progress
- Instructor: Oscar Hernan Madrid Padilla
- Text Used: John Fox, *Applied Regression Analysis and Generalized Linear Models*

- Subject Matter: Linear and generalized linear models and their application. Linear regression, analysis of variance and covariance, random effects, design and analysis of experiments, quality improvement, log-linear models for discrete multivariate data, model selection, robustness, graphical techniques, in-depth case studies.

Math 128A: Numerical Analysis

- Grade: In Progress
- Instructor: Jon Wilkening
- Text Used: Richard L. Burden, *Numerical Analysis*
- Subject Matter: Programming for numerical calculations, round-off error, approximation and interpolation, numerical quadrature, matrix computations, and numerical solutions of ordinary differential equations.

Stat C100: Principles and Techniques of Data Science

- Grade: In Progress
- Instructors: Josh Hug and Fernando Perez
- Text Used: Sam Lau, *Principles and Techniques of Data Science*
- Subject Matter: Data science lifecycle, including question formulation, data collection and cleaning, exploratory data analysis and visualization, statistical inference and prediction, and decision-making. Programming for transforming, querying and analyzing data; algorithms for machine learning methods including regression, classification and clustering; principles behind creating informative data visualizations; statistical concepts of measurement error and prediction; and techniques for scalable data processing.