Undergraduate Courses

J. Benjamin Cook
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Calculus I

Course Number:	MATH 105
University:	Nebraska Wesleyan University
Semester:	Spring 2007
Instructor:	Richard Vogt
Description:	Topics include limits, continuity, differentiation, and beginning integration with applications.
Book:	Stewart, J., 2003: *Calculus: Early Transcendentals*. 5th ed. Thomson, 1168 pp.
Grade:	A

Analytical Geometry and Calculus II

Course Number:	MATH 1552
University:	Louisiana State University - Distance Learning
Semester:	Spring 2012 (March 2012 - July 2012)
Instructor:	Mark Bilinski
Description:	Techniques of integration, parametric equations, polar coordinates, infinite series, vectors in low dimensions; introductions to differential equations and partial derivatives.
Book:	Stewart, J., 2003: *Calculus: Early Transcendentals*. 5th ed. Thomson, 1168 pp.
Grade:	A

Multidimensional Calculus

Course Number:	MATH 2057
University:	Louisiana State University - Distance Learning
Semester:	Fall 2012 (June 2012 - September 2012)
Instructor:	Paul W. Britt, M.S.
Description:	Functions of several variables; linear approximations; directional derivatives; Lagrange multipliers; double and triple integrals; vector fields and line integrals; Green's Theorem; surface integrals; Stokes' Theorem and the Divergence Theorem.
Book:	Stewart, J., 2003: *Calculus: Early Transcendentals*. 5th ed. Thomson, 1168 pp.
Grade:	A

Elementary Differential Equations and Linear Algebra

Course Number:	MATH 2090
University:	Louisiana State University - Distance Learning
Semester:	Fall 2012 (May 2012 - November 2012)
Instructor:	Paul W. Britt, M.S.
Description:	First order differential equations, linear differential equations with constant coefficients, and systems of differential equations; vector spaces, linear transformations, matrices, determinants, linear dependence, bases, systems of equations, eigenvalues, eigenvectors.
Book:	Rabenstein, A.L., 1992: *Elementary Differential Equations with Linear Algebra.* 4th ed. Thomson, 509 pp.
Grade:	A

Introduction to Discrete Structures

Course Number:	CSCE 235
University:	University of Nebraska-Lincoln
Semester:	Fall 2012
Instructor:	Chris Bourke
Description:	Set theory, relations and functions, propositional and predicate logic, methods of proof, induction, recurrence relations, principles of counting, elementary combinatorics, and asymptotic notations.
Book:	Rosen, K.H., 2003: *Discrete Mathematics and Its Applications.* 5th ed. McGraw Hill, 787 pp.
Grade:	A+

Data Structures and Algorithms for Informatics

Course Number:	CSCE 311
University:	University of Nebraska-Lincoln
Semester:	Spring 2013
Instructor:	Stephen E. Reichenbach
Description:	Coverage of algorithms includes both problems (such as indexing, searching, sorting, and pattern matching) and methods (such as greedy, divide-and-conquer, and dynamic programming). Coverage of data structures includes lists, tables, relational databases, regular expressions, trees, graphs, and multidimensional arrays.
Book:	Necaise, R.D., 2010: *Data Structures and Algorithms Using Python.* Wiley, 520 pp.
Grade:	A+

Graduate Courses

Advanced Methods of Social Research I

Course Number:	SOCI 862
University:	University of Nebraska-Lincoln
Semester:	Fall 2011
Instructor:	Jacob E. Cheadle
Description:	A review of basic inferential statistics before introducing linear and logistic regression analysis with a focus on how these statistical techniques are used to address sociological questions.
Books:	Acock, A., 2008: *A Gentle Introduction to Stata*. 2nd ed. Stata Press, 333 pp.
	Agresti, A., and B. Finlay, 2008: *Statistical Methods for the Social Sciences*. 4th ed. Pearson, 624 pp.
Grade:	A

Advanced Methods of Social Research II

Course Number:	SOCI 863
University:	University of Nebraska-Lincoln
Semester:	Spring 2012
Instructor:	Christina D. Falci
Description:	The logic and design of sociological research: the nature of science and logic of social inquiry; epistemic relations; design of research problems; data collection techniques and sampling.
Books:	Aneshensel, C.S., 2002: *Theory Based Data Analysis for the Social Sciences*. 1st ed. Sage, 280 pp.
	DeVellis, R.F., 2011: *Scale Development*. 3rd ed. Sage, 216 pp.
	Neuman, W.L., 2009: *Social Research Methods: Qualitative and Quantitative Approaches*. 7th ed. Pearson, 640 pp.
Grade:	A

Social Networks Seminar

Course Number:	SOCI 998
University:	University of Nebraska-Lincoln
Semester:	Spring 2012
Instructor:	Christina D. Falci
Description:	Our goal is to acquire a sufficient grasp of key network concepts; perform basic network analysis and graph visualization; and investigate the application of social network analysis in empirical research within sociology and related disciplines.
Book:	Scott, J., 2000: *Social Network Analysis: A Handbook*. 2nd ed. Sage, 240 pp.
Grade:	A

Categorical Data Analysis

Course Number:	STAT 875
University:	University of Nebraska-Lincoln
Semester:	Spring 2012
Instructor:	Christopher R. Bilder
Description:	Measures of associating contingency tables analysis, chi-squared tests, log-linear and logistic models, generalized estimating equations.
Book:	Bilder, C.R., and T.M. Loughin, Forthcoming: *Analysis of Categorical Data with R.* Chapman and Hall.
Grade:	A+

Mathematical Statistics I - Distribution Theory

Course Number:	STAT 882
University:	University of Nebraska-Lincoln
Semester:	Fall 2012
Instructor:	Erin Blankenship
Description:	Sample space, random variable, expectation, conditional probability and independence, moment generating functions, special distributions, sampling distributions, order statistics, limiting distributions and central limit theorem.
Book:	Casella, G., and R.L. Berger, 2001: *Statistical Inference.* 2nd ed. Duxbury Press, 660 pp.
Grade:	A

Applied Stochastic Models

Course Number:	STAT 884
University:	University of Nebraska-Lincoln
Semester:	Fall 2012
Instructor:	Dong Wang
Description:	Review of probability theory; discrete time Markov chains; discrete time branching process; Poisson process; continuous time Markov chains, a primer on hidden Markov models.
Book:	Durrett, R., 2012: *Essentials of Stochastic Processes.* 2nd ed. Springer, 275 pp.
Grade:	A+

Pattern Recognition

Course Number:	CSCE 970
University:	University of Nebraska-Lincoln
Semester:	Spring 2013
Instructor:	Stephen E. Reichenbach
Description:	Introduction to statistical decision theory, adaptive classifiers, supervised and non-supervised training. Pattern recognition systems: transducers, feature extractors, decision units. Applications to optical character recognition, speech processing, remote sensing.
Book:	Theodoridis, S., and Koutroumbas, K., 2009: *Pattern Recognition.* 4th ed. Elsevier, 984 pp.
Grade:	A

Upcoming Graduate Courses

Computing Foundations of Computational Science

Course Number:	CS 205
University:	Harvard University
Semester:	Fall 2013
Instructor:	Christopher R. Cecka
Description:	An applications course highlighting the use of computers in solving scientific problems. Students will be exposed to fundamental computer science concepts such as computer architectures, data structures, algorithms, and parallel computing. Fundamentals of scientific computing including abstract thinking, algorithmic development, and assessment of computational approaches. Students will learn to use open source tools and libraries and apply them to data analysis, modeling, and visualization of real scientific problems. Emphasizes parallel programming and parallel thinking.

Data Science

Course Number:	AC 209
University:	Harvard University
Semester:	Fall 2013
Instructor:	Hanspeter Pfister and Joseph K. Blitzstein
Description:	Learning from data in order to gain useful predictions and insights. This course introduces methods for five key facets of an investigation: data wrangling, cleaning, and sampling to get a suitable data set; data management to be able to access big data quickly and reliably; exploratory data analysis to generate hypotheses and intuition; prediction based on statistical methods such as regression and classification; and communication of results through visualization, stories, and interpretable summaries. Built around three modules: prediction and elections, recommendation and business analytics, and sampling and social network analysis.

Advanced Scientific Computing: Numerical Methods

Course Number:	AM 205
University:	Harvard University
Semester:	Fall 2013
Instructor:	David Knezevic
Description:	Scientific computing has become an indispensable tool in many branches of research, and is vitally important for studying a wide range of physical and social phenomena. In this course we will examine the mathematical foundations of well-established numerical algorithms and explore their use through practical examples drawn from a range of scientific and engineering disciplines.

Advanced Machine Learning

Course Number:	CS 281
University:	Harvard University
Semester:	Fall 2013
Instructor:	Ryan Prescott Adams
Description:	Advanced statistical machine learning and probabilistic data analysis. Topics include: Markov chain Monte Carlo, variational inference, Bayesian nonparametrics, text topic modeling, unsupervised learning, dimensionality reduction and visualization.

Systems Development for Computational Science

Course Number:	CS 207
University:	Harvard University
Semester:	Spring 2014
Instructor:	Christopher R. Cecka
Description:	This is a project-based course emphasizing designing, building, testing, maintaining and modifying software for scientific computing. Students will work in groups on a number of projects, ranging from small data-transformation utilities to large-scale systems. Students will learn to use a variety of tools and languages, as well as various techniques for organizing teams. Most important, students will learn to fit tools and approaches to the problem being solved.

Advanced Scientific Computing: Stochastic Optimization Methods

Course Number:	AM 207
University:	Harvard University
Semester:	Spring 2014
Instructor:	Pavlos Protopapas
Description:	Develops skills for computational research with focus on stochastic approaches, emphasizing implementation and examples. Stochastic methods make it feasible to tackle very diverse problems when the solution space is too large to explore systematically, or when microscopic rules are known, but not the macroscopic behavior of a complex system. Methods will be illustrated with examples from a wide variety of fields, ranging from simulating the immune system to strategies for investing in financial markets.

Information Management

Course Number:	CS 165
University:	Harvard University
Semester:	Spring 2014
Instructor:	Stratos Idreos
Description:	Covers the fundamental concepts of database and information management. Data models: relational, object-oriented, and other; implementation techniques of database management systems, such as indexing structures, concurrency control, recovery, and query processing; management of unstructured data; terabyte-scale databases.

Visualization

Course Number:	CS 171
University:	Harvard University
Semester:	Spring 2014
Instructor:	Hanspeter Pfister
Description:	An introduction to key design principles and techniques for visualizing data. Covers design practices, data and image models, visual perception, interaction principles, visualization tools, and applications. Introduces programming of web-based interactive visualizations.