

Spring 2007 Courses

American University

The following courses will be taught at American University in Spring 2007. American University is located in northwest DC at 4400 Massachusetts Avenue, NW. The Metro has a stop near campus (Red Line, Tenley/AU stop).

Most upper level classes are taught in the evenings. There are many lower level courses taught each semester, see the webpage below for information on those courses.

Students can enroll in a degree program, or take individual courses as a non-degree student. (Non-degree students can apply to a degree program and carry up to 12 credit hours toward their degree.)

More information is available online at the following webpages:

- General information about American University: www.american.edu
- Admissions to degree programs: admissions.american.edu
- Online application for non-degree students:
www.american.edu/cas/advising_visiting.cfm
(Toward the bottom of the page, look for “Instructions for Enrollment as a Nondegree Student”.)
- Information about the Math/Stat Department: www.mathstat.american.edu
- Information about times of multiple section classes and lower level courses:
www.american.edu/american/registrar/schedule.html
(Scroll down to the Statistics or Mathematics sections and click on the semester.)

For specific questions about our programs or courses, contact Prof. John Nolan by e-mail at jpnolan@american.edu or by phone at 202-885-3140.

Statistics Courses

STAT-511 Theory of Sampling II

Instructor: L. Liu Time: MW 5:20-6:35 PM

Mathematical development of basic principles of survey design, including methods for determining expected value, bias, variance, and mean square error; simple random, systematic, stratified, cluster, multistage, and double sampling; unbiased, ratio, regression, and composite estimation; optimum allocation of resources; controlled and other nonsimple methods of selection; introduction to measurement error; and comparison of alternative designs. Usually offered

alternate springs. Prerequisite: STAT-502 or equivalent.

STAT-514 Statistical Methods

Instructor: M. Gray/R. Jernigan (2 sections) **Time:** M 8:10-10:40 PM/MW 6:45-8 PM (resp.)

Averages, dispersion, probability, sampling, and approach to normality; simple and multiple regression; tests and confidence intervals for means, proportions, differences, and regression coefficients; nonparametric statistics; and analysis of variance. Usually offered every term. Prerequisite: STAT-202 or equivalent. Note: does not carry credit for majors in mathematics or statistics; students may not receive credit for STAT-514 and either STAT-300 or STAT-302.

STAT-516 Design of Experiments

Instructor: M. Jackson **Time:** M 8:10-10:40 PM

Design and analysis of the results of balanced experiments, simple analysis of variance, components of variance, analysis of covariance, and related subjects. Usually offered every spring. Prerequisite: STAT-514 or equivalent.

STAT-522 Time-Series Analysis

Instructor: E. Valaitis **Time:** TTh 8:10-9:25 PM

An introduction to the theory of time-dependent data. The analysis includes modeling, estimation, and testing; alternating between the time domain; using autoregressive and moving average models and the frequency domain; and using spectral analysis. Usually offered alternate springs (odd years). Prerequisite: STAT-515 or STAT-520 or permission of instructor.

STAT-531 Mathematical Statistics II

Instructor: J. Nolan **Time:** MW 5:20-6:35 PM

Distribution and functions of random variables, generating functions, order statistics, point estimation, maximum likelihood, confidence intervals, tests of hypotheses (Neyman-Pearson, likelihood ratio, etc.), linear regression, and analysis of variance. Usually offered every spring. Prerequisite: MATH-313, STAT-502 or equivalent, and MATH-310.

STAT-584 Introduction to Stochastic Processes

Instructor: J. Lu **Time:** MW 6:45-8 PM

Introduction to random walks, Markov chains and processes, Poisson processes, recurrent events, birth and death processes, and related subjects. Usually offered every spring. Prerequisite: MATH-501 or STAT-530 or MATH-574.

STAT-616 Regression II

Instructor: E. Malloy **Time:** TuTh 5:20-6:35 PM

Extension of regression methodology to more general settings where standard assumptions for ordinary least squares are violated. Generalized least squares, robust regression, bootstrap, regression in the presence of auto-correlated errors, generalized linear models, logistic and Poisson regression. Usually offered

every spring. Prerequisite: STAT-515.

Mathematics Courses

MATH-500 Advanced Calculus

Instructor: S. Casey Time: 11:20 AM-12:35 PM

A rigorous development of calculus and the basic techniques required for mathematical proofs. Includes mathematical induction, proof by contradiction, limit proofs, the structure of the real numbers, continuity, differentiability, sequences, and series. Additional topics, not necessarily from calculus, are chosen to illustrate proof techniques. Usually offered every spring. Prerequisite: MATH-313.

MATH-510 Geometry

Instructor: A. Elezi Time: MW 5:20-6:35 PM

Euclidean and non-Euclidean (spherical, elliptic and hyperbolic) geometries from axiomatic and analytic points of view. Includes isometrics, transformation groups, symmetry groups, quadratic forms, projective geometry, as well as some historical background. Usually offered alternate falls (even years). Prerequisite: MATH-310 or equivalent.

MATH-513 Introduction to Modern Algebra II

Instructor: TBA Time: TTh 6:45-8 PM

Groups, rings, vector spaces and modules, fields, and Galois theory. Usually offered every spring. Prerequisite: MATH-500 or permission of instructor.

MATH-521 Introduction to Analysis II

Instructor: I. Chang Time: TTh 5:20-6:35 PM

Analysis in Euclidean and metric spaces, point sets, completeness, convergence, continuity, differentiability, and integration. Usually offered every spring. Prerequisite: MATH-500 or permission of instructor.

MATH-551 Partial Differential Equations

Instructor: I. Chang Time: TF 12:45-2 PM

Fourier series, orthonormal systems, wave equation, vibrating strings and membranes, heat equation, Laplace's equation, harmonic and Green functions. Usually offered alternate springs (odd years). Prerequisite: MATH-321.

MATH-601 Harmonic Analysis

Instructor: S. Casey Time: MTh 12:45-2 PM

Harmonic analysis on the circle, the real line, and on groups. The main concepts are: periodic functions, Fourier series, Fourier transform and spherical harmonics. The course includes a brief account of the necessary ingredients from the theory of the Lebesgue integral. Usually offered alternate springs (odd years).

Prerequisite: MATH-322 or permission of instructor.