STATISTICS (STAT)

Courses

STAT 1050. Stat & Social Justice. 3 Credits.
Introduction to probabilistic and statistical reasoning, including applications to current scientific/social issues, with special focus on issues of poverty, criminal justice, environmental justice, and voting, and impact on diverse and disadvantaged populations. Prerequisites: Two years High School algebra; no credit for Sophomores, Juniors, or Seniors in the mathematical and engineering sciences; credit for only one of STAT 051 and STAT 1050. Catamount Core: D2, QD, QR.

STAT 1110. Elements of Statistics. 3 Credits.
Basic statistical concepts, methods, and applications, including correlation, regression, confidence intervals, and hypothesis tests. Prerequisites: Two years of high school algebra. Catamount Core: QD, QR.

STAT 1410. Basic Statistical Methods 1. 3 Credits.
Foundational course for students taking further quantitative courses. Exploratory data analysis, probability distributions, estimation, hypothesis testing. Introductory regression, experimentation, contingency tables, and nonparametrics. Computer software used. Credit not awarded for more than one of STAT 1410 or STAT 2430. Catamount Core: QD, QR.

STAT 1870. Intro to Data Science. 3 Credits.
Basic techniques of data harvesting and cleaning; association rules, classification, clustering; analyze, manipulate, visualize data using programming languages. Basic principles of probability and statistical modeling/inference to make meaning out of large datasets. No credit given after STAT 3000 or greater. Cross-listed with: CS 1870. Catamount Core: QD, QR.

STAT 1990. Special Topics. 1-18 Credits.
Lectures, reports, and directed readings at an introductory level. Prerequisite: As listed in schedule of courses.

STAT 1991. Internship. 1-3 Credits.
On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

STAT 1993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

STAT 2430. Statistics for Engineering. 3 Credits.
Data analysis, probability models, parameter estimation, hypothesis testing. Multi- factor experimental design and regression analysis. Quality control, SPC, reliability. Engineering cases and project. Statistical analysis software. Credit not awarded for both STAT 1410 and STAT 2430. Prerequisites: MATH 1212 or MATH 1234. Catamount Core: QD, QR.

STAT 2510. Applied Probability. 3 Credits.
Foundations of probability, conditioning, and independence. Business, computing, biological, engineering reliability, and quality control applications. Classical discrete and continuous models. Pseudo-random number generation. Prerequisites: MATH 1224 or MATH 1248 or MATH 1242. Catamount Core: QR.

STAT 2830. Basic Statistical Methods 2. 3 Credits.
Quantitative statistical methodologies useful across disciplines. Analysis of variance, multiple and logistic regression, time series analysis, non-parametric methods, Bayesian statistics and decision analysis. Prerequisite: A grade of C or better in STAT 1410, STAT 2430, or STAT 3210. Catamount Core: QR.

STAT 2870. Basics of Data Science. 3 Credits.
Basic data science techniques, from import to cleaning to visualizing and modeling, using the R language. Machine learning methods include regression, classification and clustering algorithms. Programming methods include user-defined functions. Prerequisites: STAT 1110, STAT 1410, STAT 2430, or STAT 3210. Cross-listed with: CS 2870. Catamount Core: QR.

STAT 2990. Special Topics. 1-18 Credits.
Lectures, reports, and directed readings. Prerequisite: As listed in schedule of courses.

STAT 2991. Internship. 1-18 Credits.
On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

STAT 2993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Prerequisites: Junior standing; permission of Program Director.

STAT 2994. Teaching Assistantship. 1-3 Credits.
Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

STAT 2995. Undergraduate Research. 1-18 Credits.
Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

STAT 3000. Med Biostat&Epidemiology. 3 Credits.
Introductory design and analysis of medical studies. Epidemiological concepts, case-control and cohort studies. Clinical trials. Students evaluate statistical aspects of published health science studies. Prerequisite: STAT 1110, STAT 1410, STAT 2430, or STAT 3210. Catamount Core: QR.

STAT 3010. Stat Computing&Data Anlysis. 3 Credits.
Fundamental data processing, code development, graphing and analysis using statistical software packages, including SAS and R. Analysis of data and interpretation of results. Project-based. Prerequisite: STAT 1410, STAT 2430, or STAT 3210; or STAT 1110 with Instructor permission. Catamount Core: QR.

STAT 3210. Advanced Statistical Methods. 3 Credits.
Multiple regression and correlation. Basic experimental design. Analysis of variance (fixed, random, and mixed models). Analysis of covariance. Statistical Software usage. Prerequisite: STAT 2830 with a grade of C or better; STAT 3010 recommended. Catamount Core: QR.

STAT 3240. Stats for Qualty&Productvty. 3 Credits.
Statistical process control; Shewhart, cusum and other control charts; process capability studies. Total Quality Management. Acceptance, continuous, sequential sampling. Process design and improvement. Case studies. Prerequisite: STAT 1410, STAT 2430, or STAT 3210. Catamount Core: QR.

STAT 3410. Statistical Inference. 3 Credits.
Introduction to statistical theory: related probability fundamentals, derivation of statistical principles, and methodology for parameter estimation and hypothesis testing. Prerequisites: A grade of C or better in STAT 2510 or STAT 5510; STAT 1410 or equivalent; MATH 2248. Catamount Core: QR.

STAT 3870. Data Science I - Pinnacle. 3 Credits.
Data harvesting, cleaning, and summarizing; working with non-traditional, non-numeric data (social network, natural language textual data, etc.); scientific visualization; advanced data pipelines; Project-based. Prerequisites: CS 1210; STAT 1410 or STAT 2430; CS 2100 and MATH 2522 or MATH 2544 recommended. Cross-listed with: CS 3870. Catamount Core: QR.

STAT 3880. Statistical Learning. 3 Credits.
Statistical learning methods and applications to modern problems in science, industry, and society. Topics include: linear model selection, cross-validation, lasso and ridge regression, tree-based methods, bagging and boosting, support vector machines, and unsupervised learning. Prerequisites: STAT 3210 or equivalent. Cross-listed with: CS 3880. Catamount Core: QR.

STAT 3990. Special Topics. 1-18 Credits.
For advanced students. Lectures, reports, and directed readings on advanced topics. Prerequisite: As listed in schedule of courses.

STAT 3991. Internship. 1-18 Credits.
On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

STAT 3993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

STAT 3994. Teaching Assistantship. 1-3 Credits.
Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

STAT 3995. Undergraduate Research. 1-18 Credits.
Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

STAT 3996. Undergrad Honors Thesis. 1-8 Credits.
A program of reading, research, design, and analysis culminating in a written thesis and oral defense. Honors notation appears on transcript and Commencement Program. Contact Statistics Program Director for procedures.

STAT 4810. Capstone Experience. 1-3 Credits.
Intensive experience in carrying out a complete statistical analysis for a research project in substantive area with close consultation with a project investigator. Project-based. Prerequisites: CS 1210; STAT 3210 or STAT 5210; STAT 3010 or STAT 5010; Instructor permission.