

120 - College of Liberal Arts

of the topics covered in the AP Calculus AB course and how a teacher should cover these topics. There are essentially six main areas: function theory, definitions of limits and derivatives, differentiation techniques, applications of the derivative, the definite integral and techniques of integration, and applications of the integral.

521 AP Calculus BC Certification for Teachers (3) (Prerequisite: 520 or the equivalent, or permission of State Department of Education, or permission of department) SU. Study of topics covered in the AP Calculus BC course and how a teacher should cover these topics. In addition to all subject matter covered in Mathematics 520, which will be reviewed during the course, the following topics will be emphasized: the calculus of vector functions and parametrically defined functions; polar coordinates; integration by parts, partial fractions, and trigonometric substitution; L'Hopital's rule; improper integrals; convergence of sequences of numbers and functions; series of real numbers; power series; Taylor polynomials and error approximation.

530 Special Topics in Mathematics for Teachers (3) (Prerequisite: Bachelor's degree plus eligibility for licensure in mathematics or science, or senior status as a mathematics major, or permission of department) SU. A topic of interest to secondary mathematics teachers will be logically and rigorously covered.

STATISTICS

MAJOR

No major in statistics is offered.

MINOR

A minor in statistics consist of Mathematics 134 or 312, Statistics 220, 221 and 240 plus six additional semester hours of approved statistics courses above the 200 level. Students may also use one of the following courses for three of the six additional hours of statistics courses: Biology 413, Business 305, Engineering 320, Psychology 302 or Sociology 303.

STATISTICS COURSES (STAT)

220 Statistical Methods I (3) (Prerequisite: A grade of C or higher in Math 134 or 312, or Corequisite: Math 312) F. STAT 220 is designed to introduce students in varying disciplines to statistical methods and software. By the end of the course students should have a conceptual understanding of statistical analysis and should be able to choose appropriate statistical procedures for their data. They should be able to carry out statistical tests, using software as appropriate, and draw valid conclusions.

221 Statistical Methods II (3) (Prerequisite: A grade of C or higher in Stat 220) S. STAT 221 is a continuation of Statistical Methods I (STAT 220) and is designed to introduce students in different disciplines to more complex data models utilizing statistical software. By the end of the course, students should have the conceptual understanding and knowledge to implement and interpret models using linear and multiple linear regression along with one- and two-way analysis of variance and non-parametric statistics.

240 Introduction to Statistical Computing (3) (Prerequisite: A grade of C or higher in Stat 220) F. This course will cover topics in statistical computing including reading and manipulating data, data structures, producing graphical data representations, analyzing data with statistical tests and procedures. The course will make use of appropriate statistical software such as R or SAS.

320 Introduction to Experimental Design (3) (Prerequisite: A grade of C or higher in Stat 220) S. This course will cover the design and analysis of experiments, including one and two factor analysis of variance, randomized designs, repeated measure and factorial experiments. The course will make use of appropriate statistical software such as R, SAS or Minitab.

340 Introduction to Data Science (3) (Prerequisite: A grade of C or higher in Stat 220) S. The course will introduce students to the process of extracting insight about the world through data. This includes collecting, organizing and visualizing data, understanding statistical and machine learning methods, training these methods on a particular data set, and validating and testing the results. The methods will include both supervised and unsupervised learning. Discussions will also include the importance of the bias-variance trade-off. Though the course will make use of appropriate statistical software such as SAS, R, or Python, no prior coding experience is necessary.

421 Mathematical Statistics (3) (Prerequisites: Math 306 and a grade of C or higher in Math 312 and a grade of C or higher in either Math 230 or 311) (Same as Mathematics 421) even S. This course will cover topics of statistical inference including point estimators, confidence intervals, minimum variance unbiased estimation, method of maximum likelihood estimation, large sample theory, hypothesis testing, and power of statistical tests.