



MATH 1040

Division: Natural Science and Mathematics

Department: Mathematics

Course: MATH 1040

Title: Introduction to Statistics

Catalog Description:

Introduction to Statistics is an elementary introduction to the nature of statistical reasoning. Topics to be covered include descriptive statistics, sampling and data collection, probability, sampling distribution, and introduction to inference including confidence intervals and hypothesis testing. Graphing calculator required (TI-83 preferred).

General Education Requirements: Math

Semesters Offered: Fall, Spring

Credit/Time Requirement: Credit: 3; Lecture: 3; Lab: 0

Clock/Hour Requirements: 0

Offered for Non-Credit: No

Prerequisites: MATH 1011

Justification:

This course is offered as a college level mathematics course that accomplishes the objectives of the State of Utah Quantitative Literacy requirement and is an option for students seeking to fulfill the mathematics requirement for the AA and AS degrees. This course is equivalent to the Introductory Statistics course at all state institutions and carries the same prefix and number.

Student Learning Outcomes:

Upon successful completion of this course, students will:

- understand the appropriate and inappropriate methods of collecting data for statistical purposes
- know how to represent data in a number of different graphical and numerical forms
- understand the relationship between probability and statistics as well as create and interpret various probability distributions
- recognize that statistical methods have limits and are often abused.

Content:

This course will include:

- descriptive statistics
 - graphical methods
 - numerical methods
 - simple linear regression
- probability and probability distribution

- general rules
- discrete probability distribution - the Binomial
- continuous probability distribution - the Normal
- inferential statistics
 - estimating with confidence intervals
 - hypothesis testing
 - inference for large and small samples and proportions
- additional inference topics
 - two sample hypothesis testing and confidence intervals
 - Chi-Square and Contingency Tables
- Students will complete both individual and group assignments, participate in group problem solving activities and take regular examinations. The course also includes two group projects which involve collecting, describing, and analyzing data. The use of graphing calculators is strongly emphasized.

General Education Outcomes:

1) Read effectively, constructively, and critically.

One of the crucial skills in this course is to become comfortable with the vocabulary associated with statistics and then use that knowledge along with adequate reading skill to effectively interpret mathematical situations involving statistics. Much emphasis is given on being able to "read for meaning."

3) Speak effectively in a variety of contexts.

A large component of this course is group interaction through activities and exams. Students need to learn to communicate effectively with group members in completing these assignments. Students will also make two oral presentations and will need to completely explain the processes used to gather, describe, and make decisions about data sets. Teacher and student input is given following the first presentation in order for students to make improvements for the final one.

6) Apply computational skills to a variety of contexts.

Intermediate algebra skills are a prerequisite to the course. The understanding and ability to correctly use many formulas is a major component of the course. Most important is the ability to interpret data after having applied the statistical procedures that are often computational intensive. The effective use of a statistical calculator is emphasized.

Key Performance Indicators:

Student learning will be evaluated through

- use of daily class group activities: approx. 20%
- daily homework assignments: 20%
- periodic examinations: 45%
- oral/written presentations: 15%.
- Understanding will also be evaluated by observation of students during their group discussions. Students will also be given feedback on the group exams to use in preparation for the individual ones.
- The effectiveness of the course will also be demonstrated by the ability of students to successfully use the principles in subsequent courses. Immediate feedback can be obtained from subsequent courses that

are taught at Snow College that have stated MATH 1040 as a prerequisite and where possible from upper division courses in specific majors.

- A mathematics general education course should also prepare students for understanding in their life. A goal of the course is to prepare students to be able to use their statistical understanding to read newspapers, listen to television programming, and be informed citizens.

Representative Text and/or Supplies:

- Brase and Brase, *Understanding Basic Statistics*, current edition, Houghton Mifflin Company.

Optimum Class Size: 28

Maximum Class Size: 32

Signatures:

I hereby submit this course syllabus:

Kari Arnoldsen, PhD, Professor

I hereby find this course consistent with the goals and resources of the Mathematics Department:

Kari Arnoldsen, PhD, Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)