



UConn ECE Statistics Preparation

***STAT 1100Q: Elementary Concepts of Statistics (4 credits)***

The Spire School

Spring Semester, 2025

**Course Summary and Objectives:**

STAT 1100 provides a standard approach to statistical analysis and covers topics that include elementary probability, sampling distributions, normal theory estimation and hypothesis testing, regression and correlation, and exploratory data analysis. Students will also be expected to learn and do statistical analyses via a statistical software program (*Minitab, SPSS, PSPP, or R*).

The course has 4 major components with associated *learner objectives*:

**1. Descriptive Statistics:**

- Taking raw data (univariate and bivariate) and organizing it into graphical displays
- Summarizing data numerically using measures of central tendency, measures of variation, and linear regression

**2. Data Collection Designs:**

- Understanding techniques for collecting data, selecting samples, and designing questionnaires
- Comparing observational studies to randomized experiments
- Identifying advantages/disadvantages of each method of data collection

**3. Probability:**

- Representing basic probability theory through tree diagrams and Venn Diagrams
- Evaluating discrete and continuous probability models in statistical analyses

**4. Statistical Inference:**

- Determining confidence intervals and evaluating hypothesis tests for one- and two-sample analyses

## **2024-25 Preparation:**

Address the following *prior to the start of class* January, 2025:

1. *The Power and Perils of Statistics*

Review this article: <https://wpdatatables.com/misleading-statistics/>

Consider this perspective: “Surely anything that is published or presented on TV has been reviewed for accuracy and is to be trusted.” Argue this point with counterexamples.

2. *Probability in Action*

Read about the “Birthday Paradox” and try the attached procedures at the end of the article. Be prepared to discuss in our first class:

<https://www.scientificamerican.com/article/bring-science-home-probability-birthday-paradox/>

3. *Correlation versus Causation: What is the difference and why does it matter?*

Review this article: <https://www.abs.gov.au/statistics/understanding-statistics/statistical-terms-and-concepts/correlation-and-causation>

Consider the following perspectives and provide evidence to support or refute *each*:

- a. [Music lessons improve children’s brain function.](#)
- b. [The longer you stay in school, the longer you will live.](#)
- c. [A diet rich in fish prevents teen violence.](#)

### **Supplemental information:**

An overview of stats topics with supplementary information (you can chip away at this by reviewing a topic/weekly over the summer):

<https://people.richland.edu/james/lecture/m170/>

Khan Academy Statistics Module:

<https://www.khanacademy.org/math/statistics-probability>