

# STAT 211 Lecture Notes

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## 1 Data Collection and Summarization

Statistics: Science of collecting, classifying, and interpreting data.

### Collecting Data

- Observational Study
  - Observe a group and measure quantities of interest.
  - Passive data collection.
  - Describes the group.
- Experimental Study
  - Deliberately impose treatments on groups in order to observe responses.
  - Purpose is to study whether the treatments cause a change in the responses.

Population: The entire group of interest.

Sample: A part of the population selected to draw conclusions about the entire population.

Census: A sample that attempts to include the entire population.

Parameter: A concept that describes the population.

Statistic: A number produced from a sample that estimates a population parameter.

$\bar{x}$  - *sample statistic*

$\mu$  - *mean statistic*

Experimental Group: A collection of experimental units subjected to a difference in treatment, imposed by the experimenter.

Control Group: A collection of experimental units subjected to the same condition as those in an experimental group that no treatment is imposed.