Course Objectives
• Develop Statistical Thinking.
  – Display and summarize data.
  – Evaluate probabilities.
  – Use statistical methods to reach informed decisions.

Prerequisites
• Make sure you can do basic algebra.
  – There will be a pre-test in lab.
• Make sure you can use a calculator.
  – Bring your calculator to lab.

How can I do well in this class?
• Attend all lectures and pay attention.
• Attend all labs and participate.
• Complete all assignments.
• Go over answers to assignments.
How can I do well in this class?
• READ and STUDY the textbook.
• Ask questions.
• Form study groups.

What Is Statistics?
• Statistics is a way of reasoning about and understanding the world around us.
• Statistics helps us use data to learn and to make informed decisions.

Statistics in a Word
• Statistics is about …variation.
  – The world is full of data.
  – Data exhibit variation.
  – Recognizing, displaying and quantifying variation in data can help us make sense of the world.
  – Try to explain variation.
Class activity
• Heights of Stat 104 students
• Everyone in first two rows come forward.
• Is there variability in student heights?

Class activity
• Arrange students from tallest to shortest.
• Find person in the middle (median height).
• Look at the group of taller students and the group of shorter students. What do you notice?

Class activity
• There are more men among the taller students and there are more women among the shorter students.
• Gender can explain some of the variability in height.
Stat 104 – Lecture 1

Terms

• Population: All items of interest.
  – All students in Stat 104 C
• Variable: Height (inches)
  – Numerical variable
• Sample: A few items from the population.
  – The students in the first two rows

Terms

• Statistic: Numerical summary of the sample data.
  – Average height of students in the first two rows.
• Parameter: Numerical summary of the population.
  – Average height of all students in Stat 104 C.

Population – all items of interest. Example: All students in Stat 104 C
Sample – a few items from the population. Example: Students in first 2 rows.
Parameter – numerical summary of the entire population. Example: average height of all students in Stat 104 C.
Statistic – numerical summary of the sample. Example: average height of the students in the first 2 rows.
Statistics involves
• Design – planning how to obtain data.
• Description – summarizing data.
• Inference – making decisions based on data.

Poll on the Environment
• Pew Research Center conducted November 9-14, 2011
• “From what you’ve read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not?”

Poll on the Environment
• Design – select a random sample of 2,011 U.S. adults.
• Description – 38% of the sample answered yes and believed the earth is getting warmer mostly because of human activity.
Poll on the Environment

- Inference – between 35% and 41% of the entire population of U.S. adults would answer yes and say the earth is getting warmer mostly because of human activity.

Data

- Information
- Context is important
  - Who are we collecting data on?
    - Cases: Rows in a data table.
  - What data are we collecting?
    - Variables: Columns in a data table.
Acacia bonariensis  Moist  1.59  35 59  94
Dendropanax arboresus  Moist  1.46  25 31  56
Heliocarpus americanus  Moist  2.36  30 40  70
Margaritaria nobilis  Moist  1.84  24 23  47
Pouteria macrophylla  Moist  1.55  57 46  103
Bougainvillea modesta  Dry  2.19  12 12  24
Chrysophyllum gonocarpon  Dry  1.42  59 70 129
Jacarata sp.  Dry  2.12  21 50  71
Phyllostylon rhamnoides  Dry  1.49  18 21  39
Sweetia fruticosa  Dry  1.70  28 26  54

Data

• Who?
  –Tropical trees/shrubs.

• What?
  –Species, type of forest
  –Average crown exposure, sugar (mg/g), starch (mg/g), nonstructural carbohydrate (mg/g)

What?

• Variables
  –Categorical (Qualitative) variable
    • Species
    • Type of forest
  –Numerical (Quantitative) variable
    • Crown exposure
    • Sugar, starch, and NCH concentration