

# Teaming Social Research & Statistics

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# Courses Collaborating

Math 243: Statistics I

Math 244: Statistics II

Soc 204: Sociology of Everyday Life

# Math 243 Statistics:

## Descriptive statistics

In descriptive statistics, we cover:

- Finding the mean, median, modes, standard deviation
- Pie charts, histograms, bar graphs, stem-plots
- Regression analysis, correlation, and line of best fit.
- Methods of gathering data, ethical sampling design, and designing an experimental study.
- Probability theory
- Classical probability formulas: permutations, combinations, Bayes' Theorem, and conditional probability
- Binomial theorem and its application for probability problems involving two outcomes.



# Math 244

## Inferential Statistics

- The scientific method of hypothesis testing
- A series of hypothesis tests are studied including:
  - Testing one population mean, using t, Z tests
  - Testing one population proportion, using t, Z tests
  - Testing the equality of means, difference of means
  - Testing the equality of proportions, difference of proportions
  - Testing equal variances, using F test
  - Testing independence of categories, Chi Squared analysis
  - Testing the equality of several populations, via ANOVA method using F test
  - Testing correlation, slope with a t test

# Soc 204

## Sociology of Everyday Life

- Introduction to sociological research methods of survey, experiment, and observation.
- Review an example of research in a sociology periodical
- Form interest groups to survey demographics, attitudes, group behavior, and differences.
- Design the data gathering instrument
- Identify the population and sample
- Formulate a hypothesis.
- Compile data using Excel or Powerpoint
- Presentation of findings to class



# Common course content:

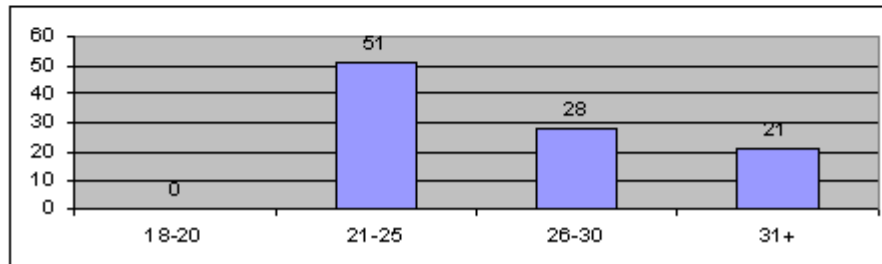
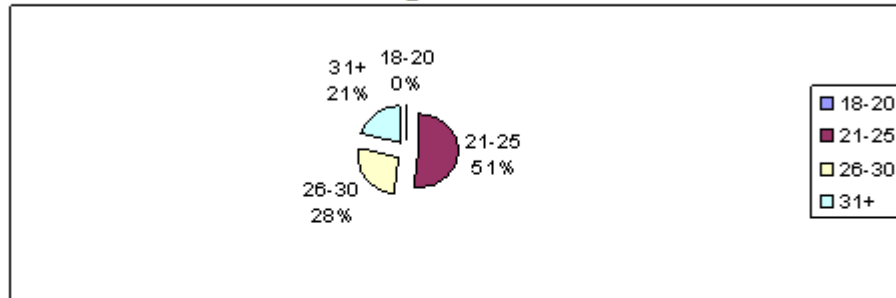
## Teaming Research Projects :

1. Research design teams
2. Sampling plan
3. Data gathering
4. Formulating Hypotheses
5. Compilation & analyzing data
6. Results, Conclusions
7. Disseminate & Class group presentations



The following data sets are  
examples of data collection  
assignments:

## Student Age Distribution



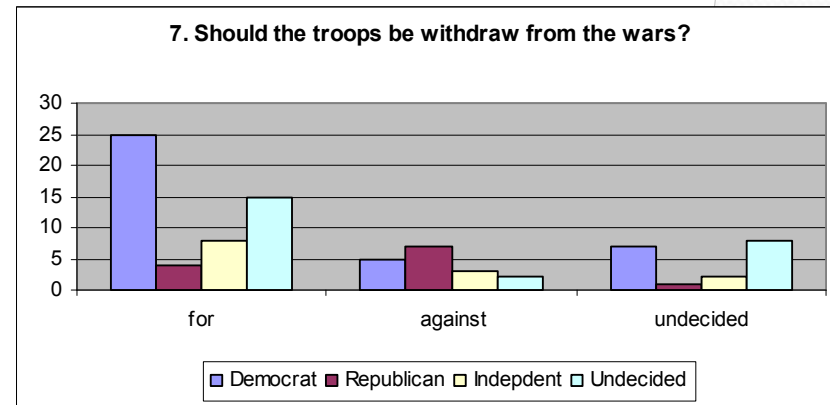
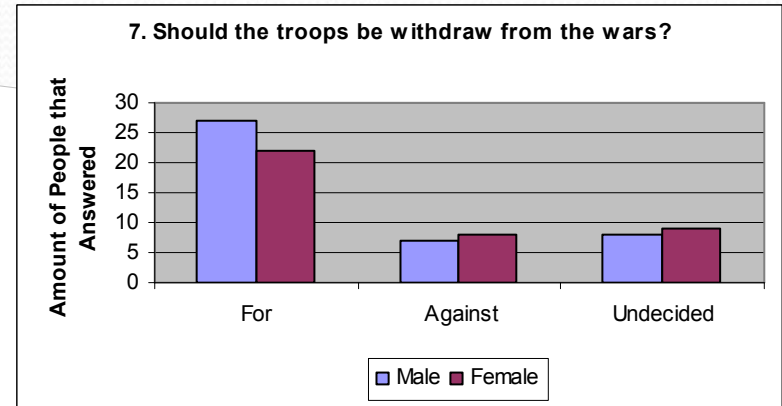
# EXAMPLE OF ANALYSIS

- This is an example of students organizing and displaying their gathered data in the form of pie charts and bar graphs. They are employing descriptive Statistics techniques via Excel programs.



## Withdrawal of Troops?

Again, most people that answered they did not believe there was any progress being made, also believe that troops need to be withdrawn.  
General Population  
Democratic stance is for,  
Republican stance is against

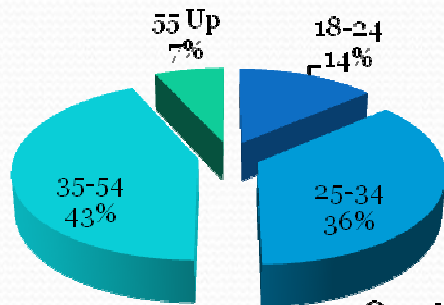


This is an example of organizing comparative data using Excel bar charts.

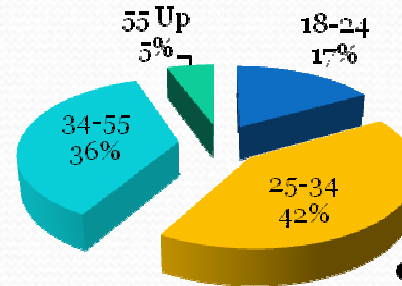
# Results based on age group

	18-24	25-34	35-54	55 Up
<u>Question 1</u>	8	21	25	4
<u>Question 2</u>	12	30	26	4
<u>Question 3</u>	10	14	22	4
<u>Question 4</u>	15	35	35	7

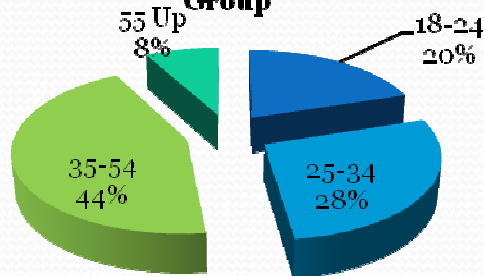
**Question 1 Based on Age Group**



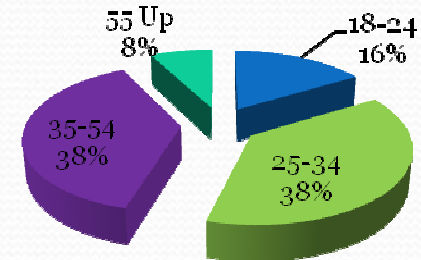
**Question 2 Based on Age Group**



**Question 3 Based on Age Group**

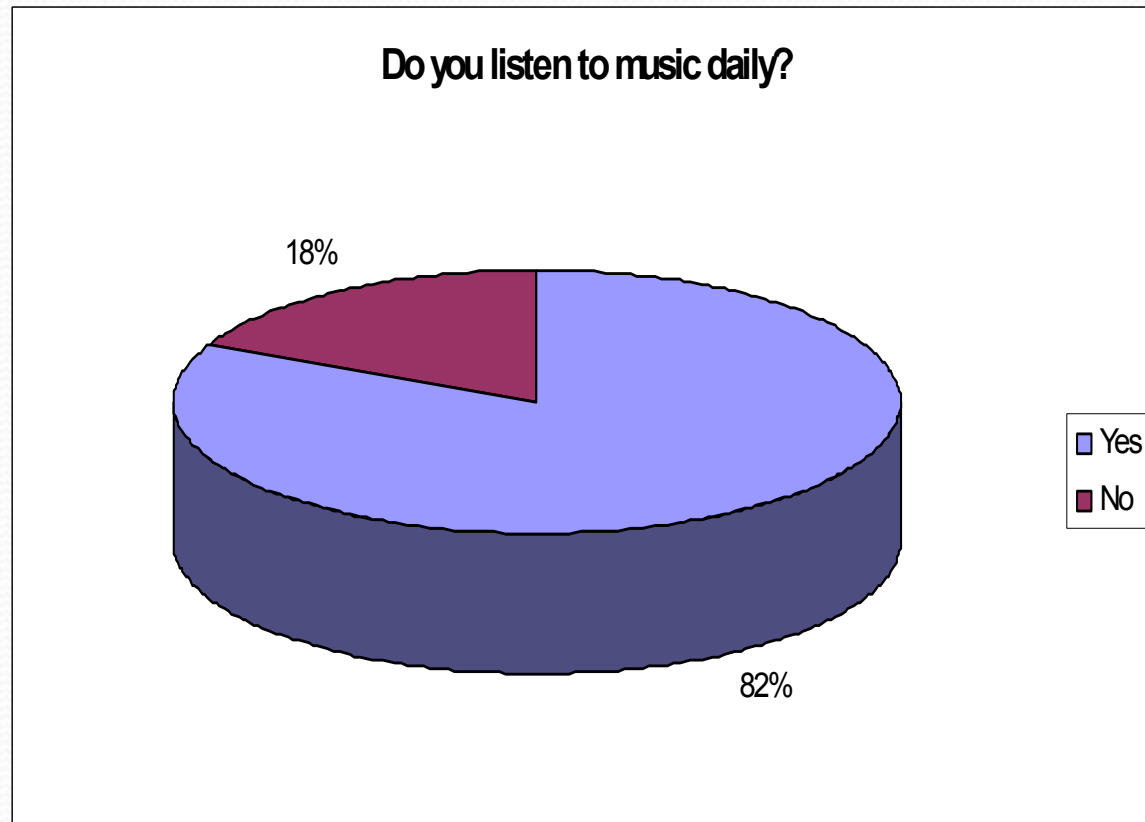


**Question 4 Based on Age Group**



This is an example of descriptive statistics, where students are organizing their findings in the form of pie charts and tables. Additionally Statistics II students & Sociology students will perform a Chi Squared Hypothesis test.

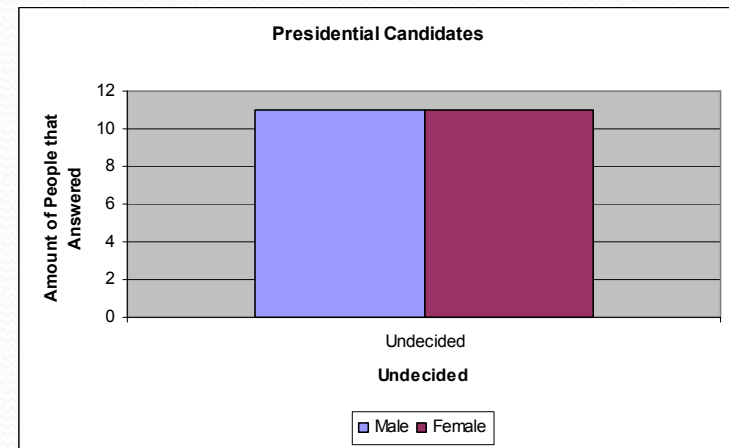
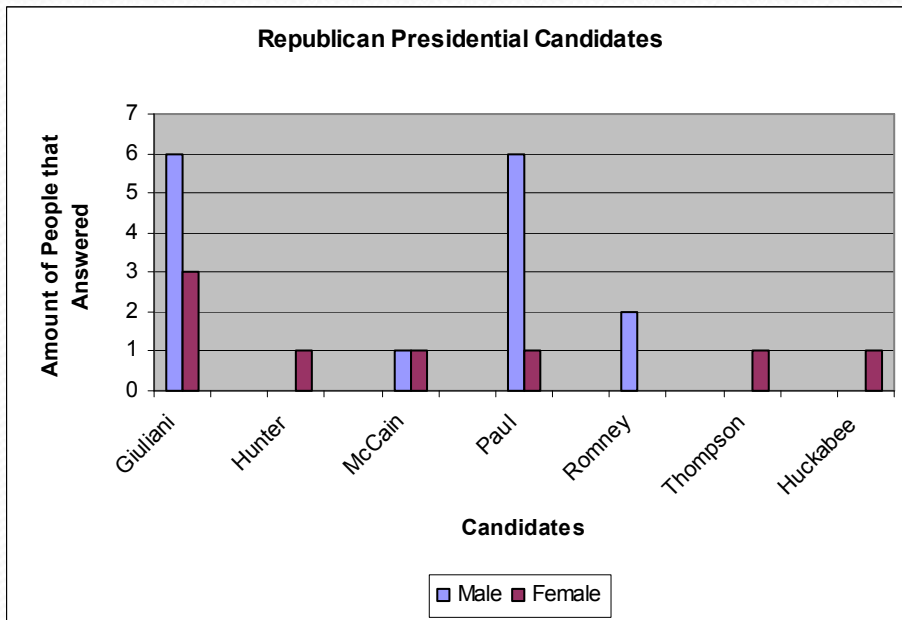
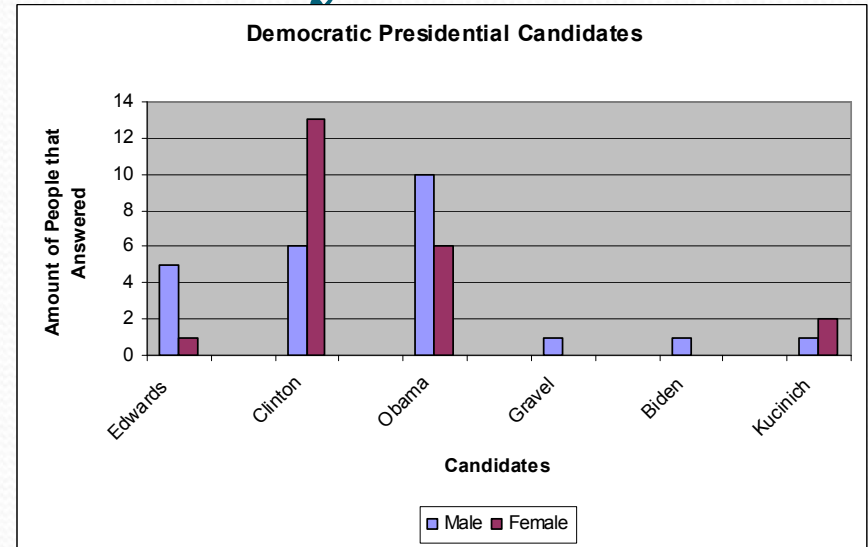
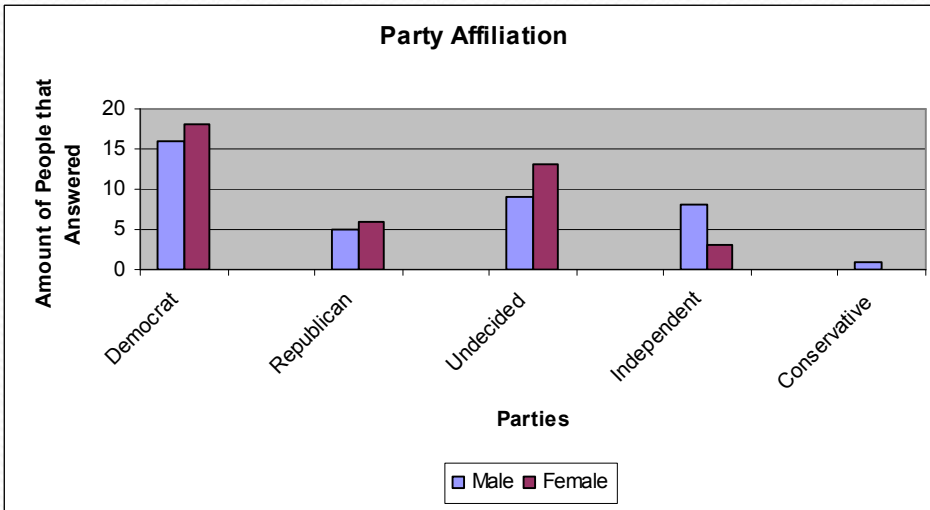
# Is music part of your daily life?



This is an example where students could perform a difference in proportions hypothesis test:  $H_0: p_1 = p_2$  against  $H_a: p_1 < p_2$

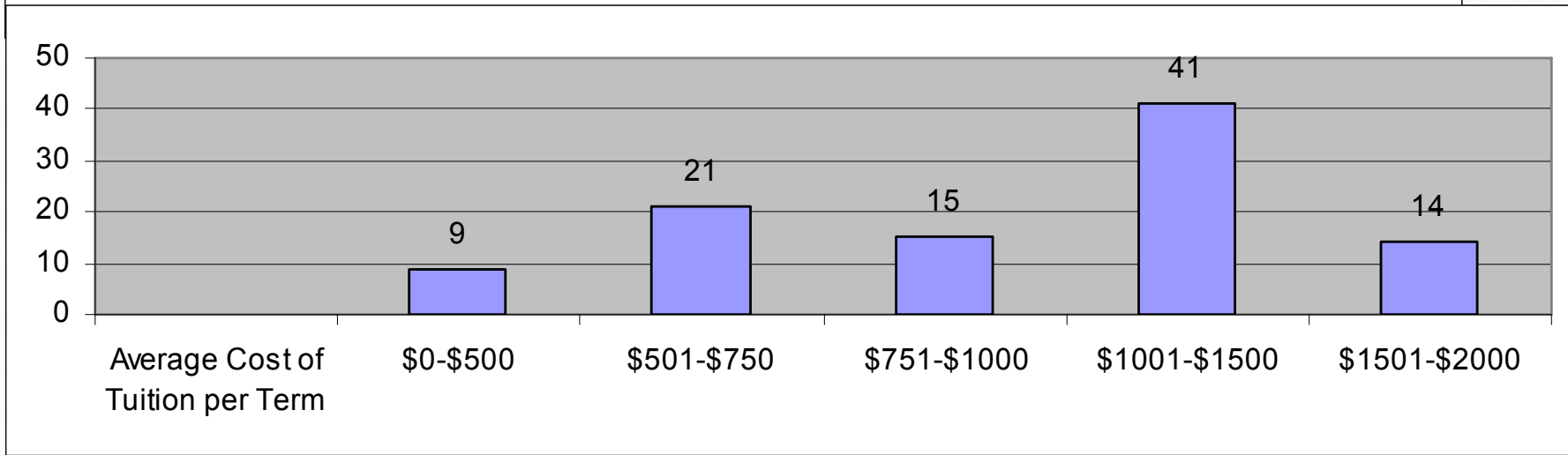
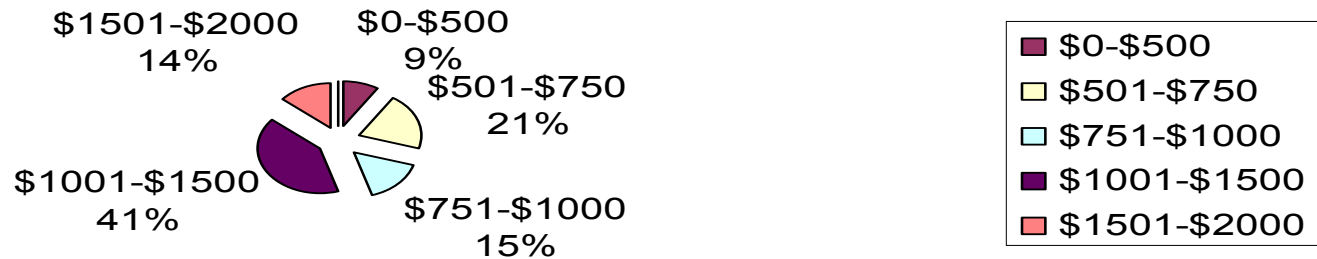


# Presidential Candidates by Gender



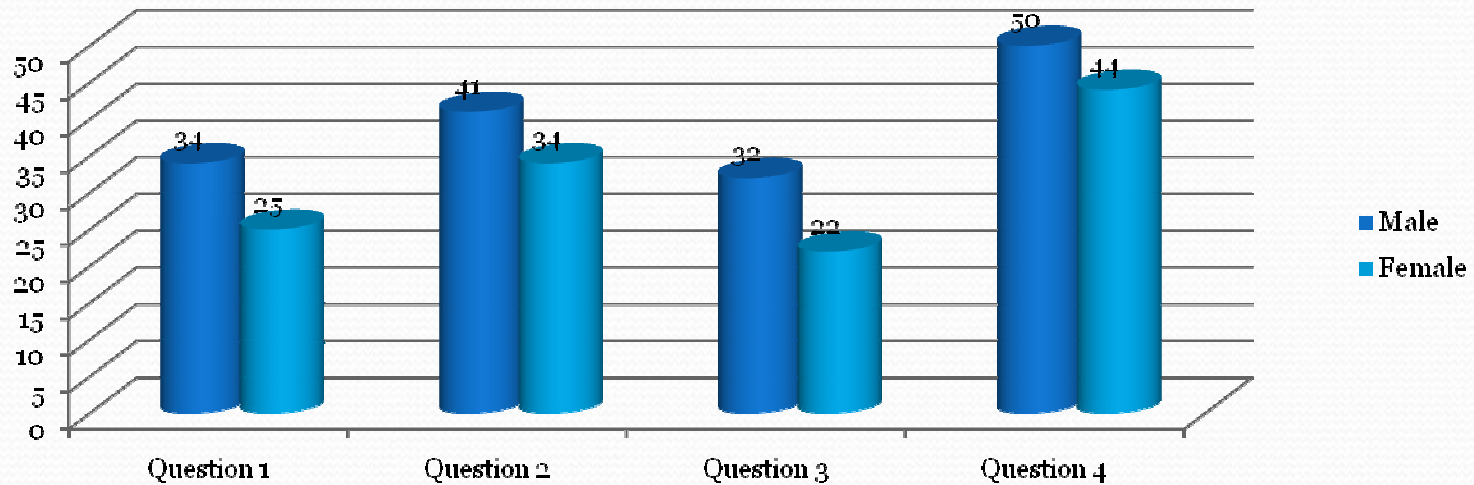
This is an example of descriptive statistics, where students are organizing their findings in the form of pie charts and tables. Additionally Statistics II students & Sociology students will perform a Chi Squared Hypothesis test.

# Money Spent on Tuition per Term



This is an example of taking multiples means for an ANOVA test.

# Results based on gender



Church				
	Question 1	Question 2	Question 3	Question 4
Male	15	15	13	15
Female	10	10	12	10

Safeway				
	Question 1	Question 2	Question 3	Question 4
Male	2	9	4	10
Female	4	10	2	15

Military				
	Question 1	Question 2	Question 3	Question 4
Male	13	11	14	17
Female	6	5	7	7

Bar				
	Question 1	Question 2	Question 3	Question 4
Male	4	5	1	8
Female	6	9	1	12

This is an example of descriptive statistics .



# Group Research project topics:

- Comparing average mileages (mpg) for Audi's, BMW, Porsches, Toyotas, etc.
- Comparing punctures rates (proportions) in brands of tires
- Comparing health insurance plans for various companies.
- Determining whether individuals learn second languages at younger ages.
- Comparing average (means) prices at local grocery stores.
- Gender or age differences in church attendance, voting patterns, exercising, nutrition, consumption patterns.
- Comparing the proportion of left vs. right handed individuals.
- Comparing students' majors, financial resources, family status, media utilization.

# Expected Learning Outcomes:

Students will be able to:

- State an operational definition of their research topic.
- Select research method (survey, experiment).
- Formulate a hypothesis.
- Gather data using sound sampling methods.
- Compile and analyze data (hypothesis testing).
- Form valid statistically significant conclusions.
- Display results for a general audience.