

# Statistics: Exam 2 Study Guide

## 1. Definitions

The first part of the exam will consist of stating definitions and theorems. These need to be stated as precisely and completely as possible. A partial list of definitions and theorems that you need to know is below:

sample space  
probability  
probability distribution  
outcome  
event  
law of large numbers  
central limit theorem  
 $t$  distribution  
normal distribution  
margin of error  
standard error estimate  
confidence interval  
null hypothesis  
alternative hypothesis  
P-value  
one-sample  $z$  statistic  
one-sample  $t$  statistic  
degrees of freedom  
statistically significant.

## 2. Short Answer

You should be able to state and evaluate the conditions for inference about a mean using both  $z$  procedures and  $t$  procedures. You should know the difference between these. You should know the difference between a normal distribution and a  $t$ -distribution. You should be able to calculate simple probabilities and understand the relation between probabilities and probability distributions (density curves). You should be able to explain the terms above. You should be able to explain the logic of significance tests.

## 3. Calculations

You should be able to calculate confidence intervals (using both  $z$  and  $t$  methods). You should be able to perform inference tests (both  $z$  and  $t$ , both 1-sided and 2-sided) and interpret the results. You should be able to discuss the effects of outliers and non-normality on confidence intervals and significance tests. You should know and be able to apply the cautions concerning inference tests.