

## WTCS Repository

10-804-189 Introductory Statistics

# Course Outcome Summary

### Course Information

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|  | Description | Students taking Introductory Statistics display data with graphs, describe distributions with numbers perform correlation and regression analyses, and design experiments. They use probability and distributions to make predictions, estimate parameters, and test hypotheses. They draw inferences about relationships including ANOVA. |
|  | Total Credits | 3.00 |

Pre/Corequisites

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| Prerequisite | Each Wisconsin Technical College determines the General Education course prerequisites used by their academic institution. If prerequisites for a course are determined to be appropriate, the final Course Outcome Summary must identify the prerequisites approved for use by the individual Technical College. |

### Course Competencies

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| 1 | Organize data |
|  | Assessment Strategies |
|  | by submitting tables, charts or graphs using software  by submitting tables, charts or graphs manually  by completing assignments/written tests/projects |
|  | Criteria |
|  | Performance will be successful when: |
|  | you construct frequency distributions  you construct histograms  you construct stem and leaf diagrams  you construct pie charts  you construct box plots  you construct line graphs  you construct bar graphs  you apply standards of spelling, English grammar, and punctuation  the choice of statistical description is appropriate to the nature of the data  graphs have the professional attributes of the class examples  graphs accurately represent the data  numerical answers are accurate |
| 2 | Summarize data numerically |
|  | Assessment Strategies |
|  | by completing assignments/written tests/projects |
|  | Criteria |
|  | Performance will be successful when: |
|  | you determine measures of central tendency  you interpret measures of central tendency  you determine measures of spread  you interpret measures of spread  you determine measures of relative position (quartiles, percentiles)  you interpret measures of relative position  the choice of statistical description is appropriate to the nature of the data  numerical answers are accurate |
| 3 | Use probability distributions |
|  | Assessment Strategies |
|  | by completing assignments/written tests/projects |
|  | Criteria |
|  | Performance will be successful when: |
|  | you distinguish between theoretical and empirical probabilities  you create a probability distribution from observational data  you calculate theoretical probabilities of events  you evaluate the parameters of a probability distribution  you apply the Normal distribution to solve problems  you apply Central Limit Theorem  the choice of statistical description is appropriate to the nature of the data  numerical answers are accurate  you apply standards of spelling, English grammar, and punctuation in stating conclusions |
| 4 | Investigate study design |
|  | Criteria |
|  | Performance will be successful when: |
|  | you distinguish between experimental and observational studies  you locate sources of data  you identify sampling techniques  you critique the validity of the analysis  you identify sources of bias  numerical answers are accurate  you apply standards of spelling, English grammar, and punctuation in stating conclusions |
| 5 | Draw inference about population parameters from sample data from one population |
|  | Assessment Strategies |
|  | by completing assignments/written tests/projects |
|  | Criteria |
|  | Performance will be successful when: |
|  | you chose appropriate procedure to construct a confidence interval for the population mean  you chose appropriate procedure to construct a confidence interval for the population standard deviation  you chose appropriate procedure to construct a confidence interval for the population proportion  you interpret confidence intervals  you analyze the role of sample size  you distinguish between random and non-random samples  you perform hypothesis test on a single population parameter  the choice of procedure is appropriate to the nature of the data (z distribution, t distribution)  numerical answers are accurate  you apply standards of spelling, English grammar, and punctuation in stating conclusions |
| 6 | Draw inference about population parameters from sample data from two or more populations |
|  | Assessment Strategies |
|  | by completing assignments/written tests/projects |
|  | Criteria |
|  | Performance will be successful when: |
|  | you chose appropriate procedure to construct a confidence interval for the difference of population means  you chose appropriate procedure to construct a confidence interval for the difference of population proportions  you distinguish between independent random samples and matched pairs  you interpret confidence intervals  you analyze the role of sample size  you perform hypothesis test on a parameter from two populations  you perform hypothesis test on a parameter from more than two populations (F distribution, ANOVA)  you perform a chi square test on a contingency table for categorical variables  you perform a chi square test for "goodness of fit"  the choice of procedure is appropriate to the nature of the data  numerical answers are accurate  you apply standards of spelling, English grammar, and punctuation in stating conclusions |
| 7 | Evaluate correlation and linear regression in bi-variate data |
|  | Assessment Strategies |
|  | by completing assignments/written tests/projects |
|  | Criteria |
|  | Performance will be successful when: |
|  | you create a scatter plot of bi-variate data  you calculate the correlation coefficient  you interpret the correlation coefficient  you construct the best fit regression line  you use the best fit line to make predictions  you use the best fit line to solve applied problems  you interpret relationships between variables  numerical answers are accurate  you apply standards of spelling, English grammar, and punctuation in stating conclusions |