

## 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 |

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 | |
|  | 1.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 1.1. | construct frequency distributions |
|  | 1.2. | construct histograms |
|  | 1.3. | construct stem and leaf diagrams |
|  | 1.4. | construct pie charts |
|  | 1.5. | construct box plots |
|  | 1.6. | construct line graphs |
|  | 1.7. | construct bar graphs |
|  | 1.8. | graphs have the professional attributes of the class examples |
|  | 1.9. | graphs accurately represent the data |
| 2. | Summarize data numerically | |
|  | Assessment Strategies | |
|  | 2.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 2.1. | determine measures of central tendency |
|  | 2.2. | interpret measures of central tendency |
|  | 2.3. | determine measures of spread |
|  | 2.4. | interpret measures of spread |
|  | 2.5. | determine measures of relative position (quartiles, percentiles) |
|  | 2.6. | interpret measures of relative position |
| 3. | Use probability distributions | |
|  | Assessment Strategies | |
|  | 3.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 3.1. | distinguish between theoretical and empirical probabilities |
|  | 3.2. | create a probability distribution from observational data |
|  | 3.3. | calculate theoretical probabilities of events |
|  | 3.4. | evaluate the parameters of a probability distribution |
|  | 3.5. | apply the Normal distribution to solve problems |
|  | 3.6. | apply Central Limit Theorem |
| 4. | Investigate study design | |
|  | Assessment Strategies | |
|  | 4.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 4.1. | distinguish between experimental and observational studies |
|  | 4.2. | locate sources of data |
|  | 4.3. | identify sampling techniques |
|  | 4.4. | critique the validity of the analysis |
|  | 4.5. | identify sources of bias |
| 5. | Draw inference about population parameters from sample data from one population | |
|  | Assessment Strategies | |
|  | 5.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 5.1. | choose appropriate procedure to construct a confidence interval for the population mean |
|  | 5.2. | choose appropriate procedure to construct a confidence interval for the population proportion |
|  | 5.3. | interpret confidence intervals |
|  | 5.4. | analyze the role of sample size |
|  | 5.5. | distinguish between random and non-random samples |
|  | 5.6. | perform hypothesis test on a single population parameter |
| 6. | Draw inference about population parameters from sample data from two or more populations | |
|  | Assessment Strategies | |
|  | 6.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 6.1. | choose appropriate procedure to construct a confidence interval for the difference of population means |
|  | 6.2. | chose appropriate procedure to construct a confidence interval for the difference of population proportions |
|  | 6.3. | distinguish between independent random samples and matched pairs |
|  | 6.4. | interpret confidence intervals |
|  | 6.5. | analyze the role of sample size |
|  | 6.6. | perform hypothesis test on a parameter from two populations |
|  | 6.7. | perform hypothesis test on a parameter from more than two populations (F distribution, ANOVA) |
|  | 6.8. | perform a chi square test |
| 7. | Evaluate correlation and linear regression in bi-variate data | |
|  | Assessment Strategies | |
|  | 7.1. | Oral, Written or Graphic Assessment |
|  | Criteria | |
|  | 7.1. | create a scatter plot of bi-variate data |
|  | 7.2. | calculate the correlation coefficient |
|  | 7.3. | interpret the correlation coefficient |
|  | 7.4. | construct the best fit regression line |
|  | 7.5. | use the best fit line to make predictions |
|  | 7.6. | use the best fit line to solve applied problems |
|  | 7.7. | interpret relationships between variables |