



Course Information

Course Title	Elementary Statistical Methods
Course Prefix, Num. and Title	Math 1342
Division	Math & Physical Sciences
Department	Mathematics
Course Type	Academic WCJC Core Course
Course Catalog Description	Collection, analysis, presentation and interpretation of data, and probability. Analysis includes descriptive statistics, correlation and regression, confidence intervals and hypothesis testing. Use of appropriate technology is recommended.
Pre-Requisites	Meet TSI college-readiness standard for Mathematics; or concurrently enrolled in NCBM 0242
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours:	3:3:0
Lab/Other Hours	
Equated Pay Hours	3
Lab/Other Hours Breakdown: Lab Hours	0
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Prepared by:		
Department Head:		
Division Chair:		
Dean/VPI:		
Approved by CIR:		

Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

Unit 1: Statistics and Data Summary

- 1.1 – Introduction to the Practice of Statistics
- 1.2 – Observational Studies versus Designed Experiments
- 1.3 – Simple Random Sampling
- 1.4 – Other Effective Sampling Methods
- 2.1 – Organizing Qualitative Data
- 2.2 – Organizing Quantitative Data: The Popular Displays
- 2.3 – Additional Displays of Quantitative Data
- 3.1 – Measures of Central Tendency
- 3.3 – Measures of Central Tendency and Dispersion from Grouped Data
- (OPTIONAL) 1.5 – Bias in Sampling
- (OPTIONAL) 1.6 – The Design on Experiments
- (OPTIONAL) 2.4 – Graphical Misrepresentations of Data

Unit 2: Measures of Dispersion and Position; Probability

- 3.2 – Measures of Dispersion
- 3.4 – Measures of Position and Outliers
- 3.5 – The Five-Number Summary and Boxplots
- 5.1 – Probability Rules
- 5.2 – The Addition Rule and Complements
- 5.3 – Independence and the Multiplication Rule
- 5.4 – Conditional Probability and the General Multiplication Rule
- 5.5 – Counting Techniques
- (OPTIONAL) 5.6 – Putting It Together: Which Method Do I Use?

Unit 3: Distribution

- 6.1 – Discrete Random Variables
- 6.2 – The Binomial Probability Distribution
- 7.1 – Properties of the Normal Distribution
- 7.2 – Applications of the Normal Distribution
- 8.1 – Distribution of the Sample Mean
- (OPTIONAL) 6.3 – The Poisson Probability Distribution
- (OPTIONAL) 7.3 – Assessing Normality
- (OPTIONAL) 7.4 – The Normal Approximation to the Binomial Probability Distribution

Unit 4: Estimation and Hypothesis Testing

- 9.2 – Estimating a Population Mean
- 9.3 – Estimating a Population Standard Deviation
- 10.1 – The Language of Hypothesis Testing
- 10.3 – Hypothesis Testing for a Population Mean
- 10.4 - Hypothesis Testing for a Population Standard Deviation
- 12.1 – Goodness-of-Fit Test
- (OPTIONAL) 9.4 – Putting It Together: Which Procedure Do I Use?
- (OPTIONAL) 10.2 – Hypothesis Tests (for a Population Proportion)
- (OPTIONAL) 10.5 – Putting It Together: Which Methods Do I Use?
- (OPTIONAL) 11.2 – Inference about Two Means: Dependent Samples

(OPTIONAL) 12.2 – Tests for Independence and the Homogeneity of Proportions

Unit 5: Correlation and Regression

4.1 – Scatter Diagrams and Correlation

4.2 – Least-Squares Regression

4.3 – Diagnostics on the Least-Squares Regression Line

(OPTIONAL) 14.1 – Testing the Significance of the Least-Squares Regression Model

(OPTIONAL) 14.2 – Confidence and Prediction Intervals

(OPTIONAL) 14.3 – Introduction to Multiple Regression

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

1. Explain the use of data collection and statistics as tools to reach reasonable conclusions.
2. Recognize, examine and interpret the basic principles of describing and presenting data.
3. Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.
4. Explain the role of probability in statistics.
5. Examine, analyze and compare various sampling distributions for both discrete and continuous random variables.
6. Describe and compute confidence intervals.
7. Solve linear regression and correlation problems.
8. Perform hypothesis testing using statistical methods.

Methods of Assessment:

Final Exam (Required)

Other Methods of Assessment:

- Hour Exams
- Homework
- Quizzes
- Short Answer
- Discussion Board
- Participation
- Projects

Required text(s), optional text(s) and/or materials to be supplied by the student:

"Statistics: Informed Decisions using Data", 5th edition, 2017; M. Sullivan, Pearson Education, Inc. (~~required~~)
Calculator (instructor's option)

Students must have computer access to the WCJC website, their WCJC student email and online accounts. WCJC has open computer labs, with internet access, on all campuses for students to use.

Suggested Course Maximum:

35

List any specific or physical requirements beyond a typical classroom required to teach the course.

None

Course Requirements/Grading System: Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

- A. Final Exam 15-30%
- B. Other Course Requirements 70-85%

- A = 90-100
- B = 80-89
- C = 70-79
- D = 60-69
- F = 59 or below

Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
 - Critical Thinking
 - Communication
 - Empirical & Quantitative Skills
 - Teamwork
 - Social Responsibility
 - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist



Foundational Component Area: Core 020: Mathematics

Course Prefix & Suffix: MATH 1342 – Elementary Statistical Methods

Core Objective:

Critical Thinking Skills—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

Student Learning Outcome Supporting Core Objective:

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Describe and compute confidence intervals. (SLO #6)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student’s written work. Grading for correctness and the rubric for critical thinking will assess this.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
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Date: 11-15-2019

Foundational Component Area: Core 020: Mathematics

Course Prefix & Suffix: MATH 1342 – Elementary Statistical Methods

Core Objective:

Communication Skills—to include effective development, interpretation and expression of ideas through written, oral and visual communication

Student Learning Outcome Supporting Core Objective:

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Describe and compute confidence intervals. (SLO #6)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student's written work. Grading for correctness and the rubric for communication skills will assess this.
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Date: 11-15-2019

Foundational Component Area: Core 020: Mathematics

Course Prefix & Suffix: MATH 1342 – Elementary Statistical Methods

Core Objective:

Empirical and Quantitative Skills—to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Student Learning Outcome Supporting Core Objective:

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Describe and compute confidence intervals. (SLO #6)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student's written work. Grading for correctness and the rubric for EQS will assess this objective.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
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