

**STATE UNIVERSITY OF NEW YORK  
COLLEGE OF TECHNOLOGY  
CANTON, NEW YORK**



**MASTER SYLLABUS**

**MATH 341 – Statistics II**

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**CANINO SCHOOL OF ENGINEERING TECHNOLOGY  
MATHEMATICS DEPARTMENT  
Fall 2018**

A. **TITLE:** STATISTICS II

B. % **COURSE NUMBER:** MATH 341

C. % **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 3 !

# Lecture Hours: 3 per week #

Lab Hours: per week

Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** N/A

E. **GER CATEGORY:** 1

F. **SEMESTER(S) OFFERED:** Spring and Fall

G. **COURSE DESCRIPTION:**

Includes confidence intervals and hypothesis testing for population proportions, variance and standard deviation; hypothesis testing two samples for differences between means; correlation and regression, including multiple regression; finding prediction intervals and hypothesis tests for the linear correlation coefficient; Chi-square tests and the F-distribution; non-parametric tests.

H. % **PRE-REQUISITES/CO-REQUISITES:**

a. Pre-requisite(s): Statistics (MATH 141) with a grade of C or better or permission of instructor.

b. Co-requisite(s): N/A

c. Pre- or co-requisite(s): N/A

I. % **STUDENT LEARNING OUTCOMES:**

Course Student Learning Outcome [SLO]	<b><u>PSLO</u></b>	<b><u>GER</u></b>	<b><u>ISLO</u></b>
a. Construct confidence intervals for the population mean, proportion, variance, and standard deviation.		1	3. <i>Quantitative Lit./Reasoning [QTR]</i>
b. Test hypotheses for the population mean, proportion, variance, and standard deviation of one sample.		1	3. <i>Quantitative Lit./Reasoning [QTR]</i>
c. Test hypotheses for the population mean, proportion, variance, and standard deviation of two samples.		1	3. <i>Quantitative Lit./Reasoning [QTR]</i>
d. Analyze datasets using regression and multiple regression.		1	3. <i>Quantitative Lit./Reasoning [QTR]</i>

e. Analyze datasets using the chi-square distribution, the F-distribution, and ANOVA.		1	3. <i>Quantitative Lit./Reasoning [QTR]</i>
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KEY	<b><u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u></b>
ISLO #	ISLO & Subsets
1	<b>Communication Skills</b> Oral [O], Written [W]
2	<b>Critical Thinking</b> <i>Critical Analysis [CA] , Inquiry &amp; Analysis [IA] , Problem Solving [PS]</i>
3	<b>Foundational Skills</b> <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	<b>Social Responsibility</b> <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	<b>Industry, Professional, Discipline Specific Knowledge and Skills</b>

J. **APPLIED LEARNING COMPONENT:** Yes \_\_\_\_\_ No **x** \_\_\_\_\_

K. % **TEXTS:** Elementary Statistics: Picturing the World, 4<sup>th</sup> Ed., R. Larson and B. Farber, Prentice Hall, 2009, ISBN 13: 9780132424339 or similar.

L. % **REFERENCES:** N/A

M. % **EQUIPMENT:** N/A

N. % **GRADING METHOD:** A-F

O. % **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Methods include:

- Exams
- Homework/Quizzes
- Projects

P. **DETAILED COURSE OUTLINE:**

I. Confidence Intervals

A. Confidence intervals for population proportions

B. Confidence intervals for variance and standard deviation

II. Hypothesis Testing – One Sample

A. Hypothesis testing for proportions

B. Hypothesis testing for variance and standard deviation !

### III. Hypothesis Testing – Two samples

- A. Testing the difference between means (large independent samples) using a  $z$ -test
- B. Testing the difference between means (small independent samples) using a  $t$ -test
- C. Testing the difference between means (dependent samples) using a  $t$ -test
- D. Testing the difference between proportions using a  $z$ -test

### IV. Correlation and Regression

- A. Finding the linear correlation coefficient
- B. Hypothesis testing the population correlation coefficient,  $\rho$
- C. Multiple regression
- D. Finding prediction intervals

### V. Chi-square Tests and the F-distribution

- A. The Chi-square goodness of fit test
- B. Using Chi-square distribution to test whether two variables are independent
- C. Using the two-sample F-test for variances
- D. One-way analysis of variance (ANOVA)
- E. Two-way analysis of variance (optional)

### VI. Nonparametric Tests

- A. Using the sign test for a population median
- B. Using the paired-sample sign test
- C. Using the Wilcoxon signed-rank and rank-sum tests to determine if two samples are selected from populations having the same distribution.
- D. Using the Mann-Whitney test to determine if the means of two samples are equal (optional).
- E. Using the Kruskal-Wallis Test to test whether three or more samples are from populations having the same distribution
- F. Using the Friedman test for dependent samples (optional).

G. Using the Spearman rank correlation coefficient to determine if the correlation between two variables is significant.

H. Using the runs test to test datasets for randomness.

Q. **LABORATORY OUTLINE:** N/A