

Course Outline

COURSE: MATH 242 **DIVISION:** 10 **ALSO LISTED AS:**

TERM EFFECTIVE: Spring 2021 **CURRICULUM APPROVAL DATE:** 12/8/2020

SHORT TITLE: ALGEBRA FOR STATISTICS

LONG TITLE: Algebra for Statistics

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
6	18	Lecture:	6	108
		Lab:	0	0
		Other:	0	0
		Total:	6	108

COURSE DESCRIPTION:

Math 242 is for students whose educational plan includes ONLY Math 5 (transfer-level Statistics). If your major is math, science, engineering, computer science, business, etc., and/or your educational plan includes any transfer-level math class other than Math 5, or you are unsure about your major, you should take Math 240. Math 240 and Math 242 are not equivalent. Math 242 prepares students for transfer-level Statistics (Math 5) by covering core concepts from Algebra and Statistics that are needed to understand the basics of college level statistics. Topics include operations on real numbers, solving equations, functions, inequalities, radicals, exponential and logarithmic functions, exploratory analysis of categorical, quantitative, single variable and bivariate data, and probability. **PREREQUISITE:** Appropriate placement.

PREREQUISITES:

- Completion of MATH 402, as UG, with a grade of C or better.
- OR
- (Completion of MATH 404D, as UG, with a grade of C or better.
- AND Completion of MATH 404E, as UG, with a grade of C or better.
- AND Completion of MATH 404F, as UG, with a grade of C or better.)
- OR
- Completion of MATH 411, as UG, with a grade of C or better.
- OR
- Completion of MATH 430, as UG, with a grade of C or better.
- OR
- Completion of MATH 205, as UG, with a grade of C or better.
- OR
- (Completion of MATH 205A, as UG, with a grade of C or better.
- AND Completion of MATH 205B, as UG, with a grade of C or better.)
- OR
- Completion of MATH 206, as UG, with a grade of C or better.

OR

Completion of MATH 233A, as UG, with a grade of C or better.

OR

Score of 17 on Elementary Algebra

OR

Score of 15 on Intermediate Algebra

OR

Score of 18 on Algebra Readiness

OR

Score of 30 on Algebra Readiness - Revised

OR

Score of 2400 on Accuplacer Math

OR

Score of 2600 on MM Placement Tool Math

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion

05 - Hybrid

71 - Dist. Ed Internet Simultaneous

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

1. Graph linear, logarithmic, and exponential functions and utilize the graphs in problem solving.

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

2. Given a graph, equation or list, identify domain, range, points on the graph and whether a graph depicts a function. Given a function, find its inverse.

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

3. Simplify and perform operations with linear, radical, logarithmic and exponential expressions. Solve linear equations and inequalities, radical, logarithmic and exponential equations. Set up equations in all of the above to solve application problems.

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

4. Calculate probabilities, including obtaining normal probabilities using tables and technology.

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

5. Describe and analyze data using descriptive statistics including histograms, frequency tables, stem-and-leaf diagrams, box plots, mean, median, mode, and standard deviation, with and without technology.

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

6. Formulate questions that can be addressed with data, then organize, display and analyze the relevant data to address these questions and communicate the results.

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

7. Investigate relationships in bivariate quantitative data and determine an appropriate mathematical model for that data. Using technology, compute the appropriate regression model, assess the validity of that model, and communicate findings;

Measure of assessment: Exam, Homework, Quizzes, Projects, In-Class Assignments

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 12/8/2020

DE MODIFICATION ONLY

10 Hours

Content: Review of operations on real numbers.

Student Performance Objectives: Students will review exponents and order of operations, evaluate and manipulate algebraic expressions and formulas commonly used in statistics (mean, median, standard deviation).

Review operations on fractions, decimals, integers, and percents.

Out-of-Class Assignments: Homework problems, projects

4 Hours

Content: Factoring and Rational Expressions

Student Performance Objectives: Students will improve mathematical fluency in factoring polynomials, simplifying

complex fractions, and solving rational equations. Students will work with statistical formulas involving complex

fractions such as odds ratios, relative risk, and hypothesis testing.

Out-of-Class Assignments: Homework problems, projects

4 Hours

Content: Review of equations and inequalities.

Student Performance Objectives (SPO): Students will be able to solve compound inequalities and express the

solution algebraically, graphically on a number line, in interval notation and in set builder notation. Students will

be able to set up and solve inequalities to solve application problems.

Out-of-Class Assignments: Homework problems, projects

4 Hours

Content: Linear Functions

Student Performance Objectives (SPO): Given two points, or one point and a slope, students will be able to construct and graph the equation of a linear function. Students will be able to write and graph functions parallel

and perpendicular to an existing line. Students will be able to visually identify points on a visual representation

(line graph or bar chart), and be able to construct and graph a linear function based upon those points. Students

will write an interpretation of the slope and the intercept, grounded in the context of the data.

Out-of-Class Assignments: Homework problems, projects

10 Hours

Content: Correlation and Regression

Student Performance Objectives (SPO): Student will be able to create a scatter plot of bivariate data, determine

whether data represent linear or nonlinear relationships. If linear, students will calculate the least squares equation of the line and use the concept of slope, y-intercept and x-intercept to analyze and communicate the

relationship between the two variables, grounded in the context of the data. Students will be able to use the graph of a line to answer questions about the relationships between variables. Using technology, students will

compute the correlation coefficient and articulate the difference between correlation and causation. Students will be able to distinguish between explanatory and response variables.

Out-of-Class Assignments: Homework problems, projects

10 Hours

Content: Introduction to functions, domain, and range.

Student Performance Objectives (SPO): Students will be able to read and interpret input and output of function

notation. Students will perform algebraic operations on functions. Given an equation, list or graph, students will

be able to determine whether it is a function or relation, find the domain, range and points on the graph.

Out-of-Class Assignments: Homework problems, projects

10 Hours

Content: Radical expressions and functions.

Student Performance Objectives (SPO):

Students will be able to express radical expressions in rational exponential form and use properties of exponents to simplify. Students will be able to simplify, add, subtract, multiply and divide radical expressions and solve radical equations

Out-of-Class Assignments: Homework problems, projects

10 Hours

Content: Exponential and logarithmic functions

Student Performance Objectives (SPO):

Students will be able to graph and analyze exponential and logarithmic functions, use properties of logarithms

to simplify and evaluate logarithmic expressions, solve logarithmic and exponential equations, and set up and

solve applications thereof, including investment, population and carbon dating.

Out-of-Class Assignments: Homework problems, projects

10 Hours

Content: Review of fractions, decimals and percents. Analysis of categorical data.

Student Performance Objectives (SPO): Students will recognize, generate and fluently use equivalent forms of

fractions, decimals and percents in the analysis of categorical data; create pie charts and bar graphs to summarize data, given a data set, create two way tables; compute, compare and explain the meaning of fractions that represent marginal and conditional distributions.

Out-of-Class Assignments: Homework problems, projects

18 Hours

Content: Analysis of quantitative data

Student Performance Objectives (SPO): Student will be

able to create histograms, frequency tables, stem leaves and box plots when analyzing quantitative data, and compute mean, median, mode, standard deviation, variance, and range with and without technology.

Students will be able to connect these statistical measures with the graphical representations of the data,

compare and analyze data sets and make conclusions. Through a project, students will

compare the distribution of quantitative data and the means of quantitative data and make conclusions about

the differences.

Out-of-Class Assignments: Homework problems, projects

16 Hours

Content: Basic principles of study design, simple experiments, sampling methods. The purpose of randomization in data collection; explanatory, response and confounding variables, simple random samples, statistical bias, bias due to other factors.

Student Performance Objectives (SPO): Formulate questions that can be addressed with data, then organize,

display and analyze the relevant data to address these questions and communicate the results. Apply the basic

principles of study design to develop and analyze the validity of simple experiments and sampling plans related

to a given situation and goal. State, explain and give examples of the following concepts: the purpose of randomization in data collection; explanatory, response and confounding variables, simple random samples, statistical bias, bias due to other factors.

Out-of-Class Assignments: Homework problems, projects

2 Hours

Final Exam

METHODS OF INSTRUCTION:

Lecture, Group work, Discussion

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 216

Assignment Description:

1. Analyze and study pertinent text material, solved examples and lecture notes.
2. Apply principles and skills covered in class by solving regularly-assigned homework problems.
3. Regularly synthesize course materials in preparation for exams.
4. Projects to apply concepts learned in class.

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 10.00 %

Out-of-class projects.

Problem-solving assignments

Percent of total grade: 10.00 %

Homework, quizzes.

Objective examinations

Percent of total grade: 80.00 %

In-class written exams.

REPRESENTATIVE TEXTBOOKS:

Required Representative Textbooks

Blitzer. Introductory and Intermediate Algebra for College Students, 5th Edition. Pearson, 2016.

ISBN: ISBN-13: 978-0134178141

Reading Level of Text, Grade: 12 Verified by: Jennifer Nari

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

GAV B4, effective 201470

CSU GE:

IGETC:

CSU TRANSFER:

Not Transferable

UC TRANSFER:

Not Transferable

SUPPLEMENTAL DATA:

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department:

CSU Crosswalk Course Number:

Prior to College Level: A

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: E

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000593567

Sports/Physical Education Course: N

Taxonomy of Program: 170100