

COC / Math / Prof. Gibson **SCV Math Learning Consortium Agenda**

April 23, 2019

4:15 – 5:15 pm

UCEN 222

Titles of COC Math Classes	Agenda Items
<p>Math 58 or 59, Prealgebra                      Math 60, Elementary Algebra                      Math 70, Intermediate Algebra                      Math 75, Intermediate Algebra for Statistics                      Math 83, Geometry  <i>Math 90, Support for Statistics</i>  <i>Math 92, Support for Trigonometry</i>  <i>Math 93, Support for College Algebra</i>                      Math 100, Liberal Arts Math  <b>Math 102, Trigonometry</b>  <b>Math 103, College Algebra</b>                      Math 104, Precalculus                      Math 111, Finite Math                      Math 130, Math for Elementary School Teachers  <b>Math 140, Statistics</b>                      Math 211, Calculus I                      Math 212, Calculus II                      Math 213, Calculus III                      Math 214, Linear Algebra                      Math 215, Differential Equations                      Math 240, Math Analysis for Business &amp; Social Sciences</p>	<ol style="list-style-type: none"> <li>1. Welcome &amp; Introductions Please Sign-In</li>   <li>2. COC Announcements and Topics:                             <ul style="list-style-type: none"> <li>Campus website update (Go live May 28)</li> <li>Course Coordinators for next year letters of interest accepted until May 1</li> <li>Math Class Schedule for Fall 2019</li> <li>How are Hart District students placing into math courses with the new assessment guidelines? (bar charts &amp; pie charts)</li> <li>AB 705 Update (delay until 4:50?) <i>See notes on next page.</i></li> <li>New classes at COC: (delay until 4:50?)                                     <ul style="list-style-type: none"> <li>PD for COC Math Faculty</li> <li>Course Outlines</li> <li>Math 100</li> </ul> </li> </ul> </li>   <li>3. Next Year                             <ul style="list-style-type: none"> <li>Co-Chair Positions</li> <li>Meeting Frequency/Dates/Times</li> <li>Goals/Tasks/Data Requests</li> <li>Fall: Aug. 19 to Dec. 7</li> <li>Spring: Feb. 10 to June 4</li> </ul> </li> </ol>

**2018-2019 Faculty Co-Chairs**

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**Mission Statement:**

*Address the gaps in student success and to realign curriculum to support student outcomes by altering delivery methods to facilitate the transition from high school to college.*

AB 705 Update Notes by Sab Matsumoto:

- A brief video about math placement and AB 705 will be available soon from COC, and the Public Information Office is producing this.
- A website that will help students with math placement will be available soon, and Michael Monsour from the Assessment Center is preparing this.
- For all new students, unless they get placed into transfer-level without co-requisite support, we are likely to recommend the following courses in Fall 2019:

Think of this as four pathways (the first four items listed below):

- Math 092/102—if the student is CERTAIN about going on to Precalculus and Calculus.\*
- Math 093/103—if the student wants a business degree.\*
- Math 090/140—if the student is not interested in a STEM or business field AND needs to take Statistics.
- Math 100—for everyone else; if the student needs neither Calculus nor Statistics in their program.
- Math 058, 060, 070 are still available for those who want more thorough reviews. (Please see the planned schedule of class for mathematics for Fall 2019.)

\*Sab and Collette have some cautions to provide for the 092/102 and 093/103 pathways.

COC Math Coordinators 2018-2019:

MATH 058/059	Angela Grigoryan
MATH 060	Ruzanna Baytaryan
MATH 070	Kelly Aceves
MATH 075	Ambika Silva
MATH 083	Luong Le
MATH 102	Mike Hubbard
MATH 103	Brandon Hilst
MATH 104	Brandon Hilst
MATH 140	Dustin Silva
MATH 211	Mike Sherry
MATH 212	Marlene Demerjian
MATH 213	Sab Matsumoto
MATH 240	Marlene Demerjian

Math Consortium 4/23/2019 Placement Notes 1

We ask students to choose from the following list as their highest math course completed:

- Arithmetic
- Pre-Algebra
- Non-AP Statistics
- Algebra 1 (Elementary Algebra)
- Geometry
- AP Statistics
- Algebra 2 (Intermediate Algebra)
- Trigonometry
- PreCalculus
- Calculus
- I did not complete any of the courses above

This key appears on the placement data shared at the 4/23/19 meeting:

- Level 1 :Math (140-90/ 130/ 100/103-93 102-92)
- Level 2 :Math 140 + Level 1
- Level 3:Math 111, 103, 102 + Level 2 & Level 1
- Level 4: Math 104 + Levels 1,2,3
- Level 5: Math 211 and Math 240 + Level 1,2,3,4

Lets look at this level of placement in another way:

	<b>STEM Pathway</b>	<b>Business Pathway</b>	<b>Statistics Pathway</b>	<b>Other</b>
Level 5	211: Calculus	240: Business Calculus		
Level 4	104: Precalculus			
Level 3	102: Trigonometry	103: College Algebra 111: Finite Math*		
Level 2			140: Statistics	
Level 1	102-92: Trig w/ Support	103-93: College Algebra w/ Support	140-90: Statistics w/ Support	100: Liberal Arts Math  130: Math for Elementary School Teachers

\*I believe that students wanting to transfer as business majors at USC need to complete Math 111. (C. Gibson)

## Math 100: Liberal Arts Mathematics

### Catalog Description:

Presents mathematical ideas and tools used to solve practical problems including logic, sets, numbers, financial calculations, probability, statistics, and patterns seen in the arts.

### Student Learning Outcome:

Apply principles of logic, mathematics, and statistics to analyze real-life situations and to recognize valid arguments and conclusions

### Objectives:

1. Apply rules of logic to determine the validity of arguments
2. Recognize use and abuse of percentages and other numbers
3. Analyze the implications of compound interest in financial calculations
4. Examine how probabilities influence decision-making
5. Identify and interpret valid statistical analysis
6. Compare and contrast linear/exponential growth and decay
7. Explain the roles of mathematics in art and music
8. Identify how mathematics is used in politics
9. Examine a significant mathematical achievement

### Prerequisite:

Placement by the Assessment Process

### Course Content Outline:

1. Mathematics and Problem-Solving
  - a. Propositions and logic
  - b. Truth tables
  - c. Sets, Venn diagrams, logical equivalence
  - d. Arguments and fallacies
  - e. Problem-solving strategies
2. Mathematics and Numbers
  - a. Unit analysis and conversion
  - b. Absolute and relative changes
  - c. Big and small numbers in perspective
  - d. Deceptive and misleading numbers

3. Mathematics and Finance
  - a. Simple and compounding interests
  - b. Continuous compounding
  - c. Savings and investment
  - d. Loans and mortgages
  - e. Federal budget and deficit
  
4. Probability and Odds
  - a. Counting principles
  - b. Permutations and combinations
  - c. Compound and conditional probabilities
  - d. Law of Large Numbers, expected value
  - e. Risk, odds, and probability
  
5. Data and Statistics
  - a. Reliability of a statistical study
  - b. Descriptive statistics—graphs, charts, tables
  - c. Correlation vs. causality
  - d. Measures of central tendency and variation
  - e. Normal distribution and the z-score
  
6. Growth and Decay
  - a. Linear modeling
  - b. Exponential modeling
  - c. Logarithmic scales
  
7. Mathematics and the Arts
  - a. Perspective
  - b. Proportion and the Golden Ratio
  - c. Music scales, harmony
  - d. Fractal geometry
  
8. Mathematics and Politics
  - a. Apportionment
  - b. Theory of voting
  - c. Big data and politics
  
9. Selected Topics (Choose one or two from the following topics)
  - Four-Color Theorem
  - Infinities
  - Cryptology
  - Topological equivalence
  - Knots, links, and their applications
  - Russell's Paradox (and other paradoxes)
  - Non-Euclidean geometry
  - History and significance of  $\pi$
  - Incompleteness Theorem

## Math 090: Support for Introductory Statistics

10/2/18, Version 4.3

### Catalog Description:

Presents basic mathematical concepts and exploratory data analysis skills that are helpful in Introductory Statistics. This course is to be taken concurrently with Math 140 and is designed to provide just-in time remediation.

### Student Learning Outcome:

Apply basic mathematical and data analysis skills to identify, analyze, and solve problems related to Introductory Statistics.

### Objectives:

1. Recognize, generate, and use equivalent forms of fractions, decimals, proportions, scientific notation, and percentages.
2. Construct, graph, and interpret linear models in Cartesian coordinates to represent relationships in quantitative data.
3. Interpret slope and y-intercept of linear equations in context
4. Use proper algebraic tools such as inequalities, intervals, radicals, and summation to describe parameters and statistics.
5. Graphically represent the distribution of categorical and quantitative data.
6. Describe statistical measures (e.g. mean, variance, standard deviation) and their characteristics.
7. Use appropriate marginal and conditional percentages to investigate relationships.
8. Use statistical software to manage and analyze data.

### Units:

1 lab unit (3 contact hours)

## Course Content Outline:

### A. Foundations in Arithmetic

1. Absolute Value
2. Decimals
3. Fractions
4. Order of Operations
5. Percentages
6. Proportions
7. Unit Conversions
8. Scientific Notation

### B. Foundations in Elementary Algebra

1. Linear Equations
2. Cartesian Coordinate System
3. Graphs as a Set of Data Points
4. Variables as Representations of Quantities
5. Variables and Parameters in Linear Models
6. Proportional Relations and Constant of Proportionality
7. Equations of Lines
8. Linear Inequalities

### C. Foundations in Intermediate Algebra

1. Graphs as the Set of Solutions
2. Slope as a Rate of Change
3. Y-intercept as the Initial Value
4. Evaluation of Algebraic Expressions
5. Interval Notation and Inequalities
6. Radicals
7. Summation Notation

### D. Foundations in Exploratory Data Analysis

1. Categorical and Quantitative Data
2. Bar Graphs, Pie Charts
3. Dotplots, Boxplots, Histograms, Scatterplots
4. Statistical Measures and Symbolic Form
5. Measures of Center
6. Measures of Spread
7. Line of Best Fit
8. Linear Equations to Make Predictions

- E. Foundations in Introductory Probability
  - 1. Contingency Tables
  - 2. Marginal and Conditional Percentages/Probabilities
  - 3. Probability Distributions
  
- F. Computer Support
  - 1. Data Management
  - 2. Statistics Software

[Sample Assignments]

Use the above information from the menu at Zachary's Chicago Pizza to answer the following questions using complete sentences:

- a. Write an equation describing the relationship between the number of additional toppings  $x$  and the total cost of a medium stuffed pizza  $C$ .
- b. What is the value of the slope of the equation from part (a)? Write a sentence that interprets the slope in the context of the problem. Please be specific, using the numerical value of the slope and appropriate units in your explanation.
- c. What is the  $y$ -intercept (as an ordered pair) of the equation from part (a)? Write a sentence that interprets the  $y$ -intercept in the context of the problem. Please be specific, using the numerical values of the intercept and appropriate units in your explanation.
- d. Draw a graph of the equation and label the axes using appropriate units.

[Sample Textbooks]

OERs by Matt Teachout

Preparing for Algebra and Statistics (3<sup>rd</sup> edition)

<http://www.matt-teachout.org/pre-algebra.html>

Introduction to Data Analysis (1<sup>st</sup> edition)

<http://www.matt-teachout.org/int-alg-for-stats.html>



## Math 093: Support for College Algebra

9/29/18, Version 2.1

### Catalog Description:

Presents basic mathematical concepts and skills that are helpful in College Algebra. This course is to be taken concurrently with Math 103 and is designed to provide just-in-time remediation.

### Student Learning Outcome:

Apply basic mathematical skills to identify, analyze, and solve problems related to College Algebra.

### Objectives:

1. Apply rules of arithmetic to evaluate numerical expressions and percentages.
2. Apply basic rules of algebra and use diagrams to solve word problems.
3. Apply algebraic properties to find slopes, intercepts, and equations of lines.
4. Apply fundamental laws of algebra to multiply, divide, and factor polynomials.
5. Apply advanced rules of algebra to carry out complex operations.
6. Apply transformations and other techniques to graph functions.

### Units:

1 lab unit (3 contact hours)

Course Content Outline:

- A. Foundations in Arithmetic
  - 1. Order of Operations
  - 2. Laws of Exponents
  - 3. Proportions
  - 4. Percentages
  - 5. Word Problems
  
- B. Foundations in Elementary Algebra
  - 1. Linear Equations and Inequalities
  - 2. Interval Notation
  - 3. Cartesian Coordinates on the Plane
  - 4. Pythagorean Theorem
  - 5. Slopes and Equations of Lines
  - 6. Radicals and Rational Exponents
  - 7. Multiplying, Dividing, and Factoring Polynomials
  - 8. Quadratic Equations
  
- C. Foundations in Intermediate Algebra
  - 1. Operations with Rational Expressions
  - 2. Functions and Their Graphs
  - 3. Asymptotes
  - 4. Basic Properties of Exponents and Logarithms
  - 5. Complex Numbers

## Math 092: Support for Trigonometry

9/29/18, Version 2.1

### Catalog Description:

Presents basic algebraic and geometric ideas, skills, and tools used in trigonometry and other STEM math courses. This course is to be taken concurrently with Math 102 and is designed to provide just-in-time remediation.

### Student Learning Outcome:

Apply basic algebraic and geometric skills to identify, analyze, and solve problems related to trigonometry.

### Objectives:

1. Apply rules of arithmetic to evaluate numerical expressions.
2. Apply basic rules of algebra to solve equations.
3. Apply rules of radicals to simplify expressions.
4. Apply definitions and theorems of geometry to reach valid conclusions.
5. Apply advanced rules of algebra to carry out complex operations.
6. Apply transformations, symmetries, and other properties to graph functions.

### Units:

1 lab unit (3 contact hours)

## Course Content Outline:

- A. Foundations in Arithmetic
  - 1. Order of Operations
  - 2. Laws of Exponents
  - 3. Proportions (for similar triangles)
  - 4. Unit Conversion (degrees, DMS, radians)
  - 5. Velocity, Distance (Length), and Time
- B. Foundations in Elementary Algebra
  - 1. Linear Equations and Inequalities
  - 2. Interval Notation
  - 3. Equations with Reciprocals
  - 4. Radicals and Rational Exponents
  - 5. Rationalizing a Denominator
  - 6. Conjugates
  - 7. Multiplying and Factoring Polynomials
  - 8. Quadratic Equations
- C. Foundations in Geometry
  - 1. Angle measures
  - 2. Triangles
  - 3. Similar and Congruent Triangles
  - 4. Pythagorean Theorem
  - 5. Cartesian Coordinates on the Plane
  - 6. Symmetries on the Plane
  - 7. Basic Proofs
  - 8. Circles and Arc Lengths
- D. Foundations in Intermediate Algebra
  - 1. Operations with Rational Expressions
  - 2. Functions and Their Graphs
  - 3. Transformations on Graphs
  - 4. Asymptotes
  - 5. Inverses of One-to-One Functions
  - 6. Equations with Extraneous Solutions
  - 7. Complex Numbers
  - 8. Conic Sections