



### High School Course of Study Approval Request Form

High School Site	Signature - Principal or Academic AP Designee	Signature - Teacher Leader <small>(enter N/A if no Teacher Leader)</small>	Comments:
American Canyon HS	Andrew Goff	Ron Eick	
Napa HS	Kate Gauger	Heather Oja	
Napa Valley Independent Studies	Susan Wilson	NA	
New Tech HS	Riley Johnson	Jon Southam	
Valley Oak HS	Maria Cisneros	Rafael Garcia Avila	Pre-Calc book for Algebra? Response: <i>This course and textbook is part of the CCAP agreement to offer existing NVC college courses on our high school campus.</i>
Vintage HS	Katelyn Estudillo	Brandon DeJesus	

Course submitted by:	Annie Petrie	School Site:	NVUSD Instructional Services
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Executive Director, Secondary Education: \_\_\_\_\_

New     Revised

COMPUTER (Short) TITLE:	CLG Math
TRANSCRIPT SPECIAL COURSE TITLE:	College Algebra
COURSE NUMBER:	CC401 [NVC Math 106]
GRADE LEVEL:	11 - 12
LENGTH OF COURSE:	1 College Semester (1 year)
GRAD REQUIREMENT:	Mathematics (H)
CSU/UC REQUIREMENT:	"c" (Mathematics)
COLLEGE PREP:	Yes
HONORS:	Yes
VOCATIONAL ED:	No
CALPADS CODE:	2490 (Dual Enrollment College Course - Mathematics)
PATHWAY CODE:	No
NCLB :	Yes
NCLB CORE SUBJECT:	MT

## **Course Outline Information**

### **1. Student Learning Outcomes:**

1. Graph polynomial, rational, radical, exponential, logarithmic and conic equations by hand.
2. Solve polynomial, exponential, logarithmic, systems of equations and inequalities.

### **2. Course Objectives:** Upon completion of this course, the student will be able to:

1. Analyze and investigate properties of functions;
2. Synthesize results from the graphs and/or equations of functions;
3. Graph the elementary functions, examine their basic properties, and apply transformations to the graphs of functions;
4. Recognize the relationship between functions and their inverses graphically and algebraically;
5. Solve and apply rational, linear, polynomial, radical, absolute value, exponential and logarithmic equations, by hand and with technology;
6. Solve linear, nonlinear, and absolute value inequalities;
7. Solve systems of equations and inequalities;
8. Apply the Remainder Theorem, Factor Theorem, and the Fundamental Theorem of Algebra;
9. Apply functions and other algebraic techniques to model real world Science, Engineering and/or Mathematical applications;
10. Analyze conic sections algebraically and graphically;
11. Use formulas to find sums of finite and infinite series; and
12. Use limit notation to discuss end behavior of polynomial and rational functions.

### **3. Course Content**

1. Functions including linear, polynomial, rational, radical, exponential, absolute value, logarithmic: definitions, evaluation, domain and range;
2. Inverses of functions;
3. Algebra of functions;
4. Graphs of functions including asymptotic behavior, intercepts and vertices;
5. Transformations of quadratic, absolute value, radical, rational, logarithmic and exponential functions;
6. Equations including rational, linear, polynomial, radical exponential, absolute value and logarithmic;
7. Linear, nonlinear and absolute value inequalities;
8. Systems of equations (with matrices) and inequalities;
9. Partial fraction decomposition;
10. Characterization of the zeros of polynomials;
11. Properties and applications of Complex numbers;
12. Properties of conic sections;
13. Sequences and series including arithmetic, geometric, recursive, subscript notation and sigma notation;
14. Introduction to limit notation and continuity via polynomial and rational functions.

### **4. Methods of Instruction:**

Activity

Discussion

Lecture

Observation and Demonstration

Projects

**5. Methods of Evaluation:** Describe the general types of evaluations for this course and provide at least two, specific examples.

**Typical classroom assessment techniques**

Exams/Tests --

Quizzes --

Oral Presentation --

Projects --

Home Work --

Final Exam --

Mid Term --

**Additional assessment information:**

The Mathematics Department maintains a commitment to diverse teaching methods in courses emphasizing vital quantitative skills and qualitative reasoning ability (PEP Program Mission Statement, 2011). To that end, it is expected that sufficient formative assessments will be given to students that in frequency, length and rigor adequately assess both quantitative skills and qualitative reasoning.

Sample assessment questions follow:

1 - For the function  $f(x) = 2x^3 - 3x^2 - 11x + 6$ ; Use the Rational Zero Theorem to find all the zeros.

2 - Find the vertical asymptotes, if any, and the values of  $x$  corresponding to holes, if any, of the rational function  $f(x) = \frac{x + 7}{x^2 + 4x - 21}$

Letter Grade Only

**6. Assignments:** State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

- **Reading Assignments**

Read sections from the textbook, for example:

1. Read section 2.5 on Transformations of Functions. Be ready to discuss and work on graphing activities in class.

2. Read section 7.1 on The Ellipse. Be ready to discuss and work on graphing activities in class.

- **Writing Assignments**

Students will solve text problems regarding College Algebra, for example:

1. Complete exercises 1 - 15 odd from section 3.3 on dividing polynomials.

2. Find all requested information and graph the indicated rational functions in exercises 21 - 56 odd from section 3.5 on rational functions and their graphs.

- **Other Assignments**

**7. Instructional Materials**

Book: **Precalculus** (open source resource)

Author: **Jay Abramson**

Publisher: OpenStax Textbook

Date of Publication: 2014

**[New - request for adoption approval submitted at this Board Meeting]**

**Other required materials/supplies.**

- **Graphing Calculator**