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Teacher Contact

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* **Was this course Previously Approved by UC?**   No

* **Course Title:**   Integrated Math III

* **Transcript Title /Abbreviation:**

Transcript Title /Abbreviation: Course Code

   a-g Mathematics III

   a-g Integrated Math III

* **Seeking "Honors" Distinction:**   No

* **Subject Area:**   Mathematics

* **Category:**   [Integrated Math 3 ▾]

* **Grade Level for which this course has been designed:**   ☐ 9 ☐ 10 ☑ 11 ☑ 12

* **Unit Value:**   1.0 (one year, 2 semesters, or 3 trimesters equiv.)

* **Is this course, or any separate section of this course, taught in an online learning**   No

environment:

* Is this course classified as a Career Technical Education: No

* Brief Course Description

Integrated Mathematics III is the third of three mathematics courses required for college entrance. The course content expands upon the mathematical content and techniques of Integrated Math II. Connections among the strands and unifying ideas continue with attention given to depth of understanding. Students successfully completing Math III are prepared for Pre-Calculus or alternative mathematics courses that emphasize real-world applications in the social sciences, or life and physical sciences. The course emphasizes advanced Algebra and Trigonometry.

Pre-Requisites

Grade of C or better in Integrated Math II - Required

Co-Requisites

Context for Course (optional)

History of Course Development (optional)

Textbooks

TEXTBOOK 1

* Title:
Pearson Integrated Math III

* Edition:
CA

* Publication Date:
2014

* Publisher:
Pearson Learning

* Author(s):
Dr. Randall I. Charles et al.

TEXTBOOK 1

URL Resource:

* Usage:

Primary Text

Read in entirety or near entirety

TEXTBOOK 2

* Title:

Carnegie Integrated III

* Edition:

CA

* Publication Date:

2004

* Publisher:

Carnegie Learning Inc.

* Author(s):

William S. Hadley et al.

URL Resource:

* Usage:

Supplementary or Secondary Text

Read in entirety or near entirety

TEXTBOOK 3

* Title:

Core Plus Mathematics Course 3

* Edition:

CA

* Publication Date:

2008

* Publisher:

McGraw-Hill

* Author(s):

Christian R. Hirsch et al.

TEXTBOOK 3

URL Resource:

* **Usage:**

Supplementary or Secondary Text

Read in entirety or near entirety

Supplemental Instructional Materials

Solutions Manuel- A complete solution for each problem in the Student Edition lessons.

Khan Academy- www.khanacademy.org- Videos and extra practice to ensure student comprehension.

LearnZillion- www.learnzillion.com- Videos and extra practice to ensure student comprehension.

CSI Algebra 2- 21st Centure Math Projects- Group unit projects to help students relate content to the real-world.

* **Course Purpose**

The purpose of Math III is to expand upon the mathematical content and techniques of Integrated Math II course. The course will emphasize skills necessary for problem-solving and continued growth in mathematics. Students apply methods from probability and statistics to draw inferences and conclusions from data, expand their knowledge of functions to include polynomial, rational, and radical functions, expand their study of right triangle trigonometry to include general triangles, and bring together all of their experience with functions and geometry to create models and solve contextual problems. The integrated math program is an alternate approach to achieve mathematical understanding. The content provides the foundation for future work in mathematics and science. An understanding of integrated mathematics is essential in preparation for careers that utilize or depend on mathematics. It provides students with the tools to represent and solve problems in a variety of ways. Students will better understand the language and abstract symbols of mathematics and how to use that language in real-life applications.

Throughout the course, common core standards are applied through Mathematical Practice Standards to ensure students experience mathematics as useful, logical, and coherent. Math III provides opportunity for students to discover means of making sense of their world through the application of subject matter to real-world problems as well as making sense of the subject matter through its application to real-world encounters, while practicing and improving fluency in computation and communication. Students will look for and discover examples in their world where the ideas and methods of the course can be applied. They will look for and discover patterns, test conjectures and try multiple representations and approaches to analyze examples, discover solutions and verify the validity of their solutions. They will communicate their findings with precision and accuracy.

* Course Outline

The intent of Math III is to explore, investigate, and understand the importance of mathematics through real-world experiences. In mathematics, students will acquire the knowledge and skills to problem solve, communicate, reason create models, and make connections.

The key assignments in each unit will include textbook problems, informal and formal assessments, group activities, and interactive learning problems, technology labs, and activity labs for each lesson found on the students online course access. These key assignments and labs will reinforce the necessary topics and skills needed to help students reach mastery of these topics and skills.

Math III focuses on the following 4 key units:

Unit 1: Students see how the visual displays and summary statistics they learned in earlier grades relate to different types of data and to probability distributions. They identify different ways of collecting data and see what conclusions can be drawn.

At the end of this unit, students will be able to:

- Summarize, represent, and interpret data on a single count or measurement variable

- Summarize, represent, and interpret data on two categorical and quantitative variables

- Understand and evaluate random processes underlying statistical experiments

- Make inferences and justify conclusions from sample surveys, experiments, and observational studies

Unit 2: This unit develops the structural similarities between the system of polynomials and the system of integers. Students draw on analogies between polynomial arithmetic and base-ten computation, focusing on properties of operations, particularly the distributive property. Students connect multiplication of polynomials with multiplication of multi-digit integers, and division of polynomials with long division of integers. Students identify zeros of polynomials and make connections between zeros of polynomials and solutions of polynomial equations. The main theme in this unit is that the arithmetic of rational expressions is governed by the same rules as the arithmetic of rational numbers.

At the end of this unit, students will be able to:

- Understand the relationship between zeros and factors of polynomials

- Use polynomial identities to solve problems

- Rewrite rational expressions

- Understand solving equations as a process of reasoning and explain the reasoning

- Create equations that describe numbers or relationships.

Unit 3: Students develop the Law of Sines and Cosines in order to find missing measures of general (not necessarily right) triangles. This discussion of general triangles open up the idea of trigonometry applied beyond the right triangle. Students build on this idea to develop the notion of radian measure for angles and extent the domain of trigonometric functions to all real numbers.

At the end of this unit, students will be able to:

- Extend the domain of trigonometric functions using the unit circle

- Model periodic phenomena with trigonometric functions

- Prove and apply trigonometric identities

Unit 4: In this unit students generalize what they have learned about a variety of function families. They extend their work with exponential functions to include solving exponential equations with logarithms. They explore the effects of transformations on graphs.

At the end of this unit, students will be able to:

- Interpret functions that arise in applications in terms of the context

- Analyze functions using different representations

- Construct and compare linear and exponential models and solve problems

* **Key Assignments**

- Unit by unit problem sets: Problem sets range from simple equations and move toward real life application problems that require a deeper understanding of concepts. Short answer and essay questions will also be included so students can justify steps, explain answers, etc. Daily homework assignments will be designed to increase fluency in computation, use formulas and process and accuracy in representations, and communication to basic concepts and terminology.

- Group projects/investigations: Group projects discussed at the beginning of each unit designed to develop cooperative communication and problem

solving including brainstorming strategies and best problem-solving models in applied situations. Student based projects will incorporate practical applications of key concepts from each unit. Projects will include discussion of what models are used, why they were selected, how they were applied, the outcome of the application, and an analysis of their findings. Student projects may be presented orally, digitally, or in written form. Practical applications will include gathering, modeling, and analyzing data that is both linear and nonlinear and architectural representations of geometric concepts.

- Specific group projects will be selected from CSI Algebra 2 and Geometry 21st Century Math Projects. CSI Algebra 2 and Geometry is a collection of different algebraic and geometric inspired mathematical puzzles. The puzzles are intended to target specific Algebra 2 and Geometry units, but also add additional challenging questions to each activity. Each puzzle has six "scenes" which will uncover a mystery variable. These six mystery variables will be used to decode a cryptic text message and if everything is correct, the result will match one of the six suspects. Students will be actively engaged in the puzzle solving element in these projects. Each puzzle uses a variety of levels of problems to keep a variety of learners engaged and challenged.

* Instructional Methods and/or Strategies

College Model of Education: Personalized Learning Model emphasizes independent study while attending Resource Center classes 2-3 times a week. Students may choose to meet weekly with their Personalized Learning Teacher and/or Highly Qualified Teacher instead. The same instructional methods are used in either case.

- Direct Instruction- From center classes 2-3 times a week

- Project/Group Work- In class and independently from CSI Algebra and CSI Geometry 21st Century Math Projects

- On-line/Interactive Instruction- Khan Academy and Learnzillion.com

- Presentation- Concepts are introduced, explained, and demonstrated during weekly class/teacher (Personalized Learning and Highly Qualified) meetings. Following the information, corresponding questions, writing assignments, and activities are given to evaluate comprehension.

- Discussion- Students analyze, discuss, and respond to issues and ideas stimulated by presentations and readings. Students work in small groups or one-on-one whenever possible to increase participation.

- Oral Presentation- Students present information during weekly class meetings both formally and informally. Presentations include Power Point, debate, and discussion, and always include an outline or handout and audiovisual aides.

- Visual and graphic descriptions of problems

- Hands-on projects and experimental learning

- Interactive online lessons and projects using iPads/Computers

- White boards

- Problem-based learning

* Assessments Including Methods and/or Tools

- Attendance at Resource Center class 2-3 times a week OR weekly review of work by Personalized Learning Teacher/Highly Qualified Teacher

- Discussions- Classroom participation and small group work. If not enrolled in Resource Center class then weekly discussion with Personalized Learning Teacher/Highly Qualified Teacher.

- Formative Assessment- Placement exams for incoming students to properly assess knowledge.

- Observational Assessment- Students are asked to participate, discuss, and explain methods to class. (Every day)

- Project-based Assessment- Students are asked to work together on projects. Projects are based on units learned throughout the text.

- Traditional Assessments- Includes end of chapter exams (multiple choice and written response). A final exam will be given at the end of each semester (multiple choice and written response).

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