

Course Title: IMP-2B (P)

Replacing an existing course? Updating IMP-Course 2B

To be submitted for A-G? Yes

Department Mathematics

Career Path – (if any)

Description of Target Group

IMP-2B is for students who have successfully completed IMP-2A.

Purpose

- a) Length of course: one term/one semester
- b) Units: 5

IMP is a fully integrated, four-year college preparatory sequence of courses in mathematics designed to replace the traditional Algebra I, Geometry, Algebra II sequence. The sequence of topics is herein being rearranged between IMP-1 and IMP-2 in order to allow students to meet state math requirements for graduation in a single course and to facilitate a more natural transition from 8th-grade algebra to IMP-2. All Algebra-1 standards are being moved down into IMP-1, and the geometry, statistics, probability and trigonometry topics are being moved from IMP-1 to IMP-2. The topics listed below are covered in IMP-2B in a unified fashion, in the context of meaningful larger mathematical problems.

From Geometry:

- Using trigonometric functions for right triangles
- Developing the meaning of area, including use of non-standard units
- Developing and using several methods for finding areas of polygons, including formulas for area of triangles, rectangles, parallelograms, trapezoids and regular polygons
- Understanding and finding surface area and volume for three-dimensional solids, including prisms and cylinders
- Discovering and using the Pythagorean Theorem, and understanding a proof of it
- Finding figures of maximum area for a given perimeter
- Understanding the relationship between area of similar figures
- Using and developing methods for creating tessellations

From Trigonometry:

- Developing and applying right triangle trigonometric functions and their inverses.

From Probability and Statistics:

- Collecting and analyzing data
- Drawing inferences from statistical data
- Designing, conducting and interpreting statistical experiments
- Making and testing statistical hypotheses
- Formulating null hypotheses and understanding their role in statistical reasoning
- Understanding and using the χ^2 (chi square) statistic

IMP 2B (P) – continued

From Logic:

- Making and testing conjectures
- Constructing sound logical arguments
- Formulating counterexamples
- Developing and describing algorithms and strategies
- Understanding the idea of proof
- Working with indirect proof and proof by contradiction
- Using “if..., then” statements

Prerequisites – Completion of IMP-2A with a grade of C or better.

Standards of Expected Student Achievement

- Problem-solving
 - Working on long-term problems
 - Drawing on diverse knowledge and methods to solve problems
 - Applying appropriate technology to problem solving
 - Posing questions related to a problem
 - Generalizing problems
- Group work
 - Working cooperatively with others
 - Sharing ideas
 - Asking for assistance
 - Subdividing a task so that group members can work independently on different parts of it
- Writing and communication
 - Reading and understanding complex problems
 - Summarizing the essential ideas of a problem
 - Describing methods used to approach a problem
 - Explaining reasoning used in solving a problem
 - Evaluating and improving the quality of written work
 - Making oral presentations

Methods of Assessment of Student Learning

Students will be assessed using a combination of individual and cooperative group tests and quizzes, class work and homework assignments, Problems of the Week, oral presentations and portfolios.

Instructional Materials

Refer to: Secondary Adopted Texts and Approved Supplementary Books Used in the Santa Maria Joint Union High School District

Activities

This course will be presented as determined by the methods and techniques of the instructor and will utilize lecture, demonstration, group work, cooperative learning, investigations, manipulatives, graphing calculators, oral and written communication, study, drills, quizzes, and examinations.