

**MT. DIABLO UNIFIED SCHOOL DISTRICT
COURSE OF STUDY**

COURSE TITLE: IB Mathematical Studies Standard Level (SL)
COURSE NUMBER: 350265
CBEDS NUMBER: 2463
DEPARTMENT: Mathematics
LENGTH OF COURSE: 1 Year
CREDITS PER SEMESTER: 5
GRADE LEVEL(S): 11th or 12th
REQUIRED OR ELECTIVE: Fulfills required a-g “c” for mathematics and elective “g”

PREREQUISITES:
Required - Completion of Algebra II or teacher recommendation
Recommended -

BOARD OF EDUCATION ADOPTION: May 22, 2017

NOTE: This course is previously approved by the UC/CSU, under the International Baccalaureate Organization (IBO). The official IB Subject Guide was used to create the Course of Study submitted to the IBO on April 1, 2016, along with the Application for Authorization. The Course of Study submitted was approved by the IBO as meeting the requirements of the course. **Please see the attached Mathematical studies SL guide published by the IBO, 2012.**

COURSE DESCRIPTION:

The IB Diploma Programme Mathematical Studies Standard Level (SL) course focuses on important interconnected mathematical topics. The syllabus focuses on:

- Placing more emphasis on student understanding of fundamental concepts than on symbolic manipulation and complex manipulative skills
- Giving greater emphasis to developing students’ mathematical reasoning rather than performing routine operations
- Solving mathematical problems embedded in a wide range of contexts
- Using the calculator effectively

There is also an emphasis on applications of mathematics and statistical techniques. It is designed to offer students with varied mathematical backgrounds and abilities the opportunity to learn important concepts and techniques and to gain an understanding of a wide variety of mathematical topics, preparing them to solve problems in a variety of settings, develop more sophisticated mathematical reasoning and enhance their critical thinking.¹

COURSE PURPOSE:

The aims of all DP mathematics courses are to enable students to:

- Enjoy and develop an appreciation of the elegance and power of mathematics

¹ IBO, Subject Brief Mathematics: Mathematical studies - Standard level, 2014

- Develop an understanding of the principles and nature of mathematics
- Communicate clearly and confidently in a variety of contexts
- Develop logical, critical and creative thinking, and patience and persistence in problem-solving
- Employ and refine their powers of abstraction and generalizations
- Apply and transfer skills to alternate situations, to other areas of knowledge and to future developments
- Appreciate how developments in technology and mathematics have influenced each other
- Appreciate the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics
- Appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives
- Appreciate the contribution of mathematics to other disciplines, and as a particular “area of knowledge” in the TOK course²

COURSE OUTLINE:

(Please see Mathematical Studies SL Guide, pages 10 to 34, for more details.)

The course is divided into seven topics:

Topic 1: Numbers and algebra

Topic 2: Descriptive statistics

Topic 3: Logic, sets and probability

Topic 4: Statistical application

Topic 5: Geometry and trigonometry

Topic 6: Mathematical models

Topic 7: Introduction to different calculus

KEY ASSIGNMENTS:

(Please see Mathematical Studies SL Guide, pages 10 to 34, for more details.)

INSTRUCTIONS METHODS and/or STRATEGIES:

(Please see Mathematical Studies SL Guide, pages 4 to 34, for more details.)

General IB approaches to teaching are:

- Based on inquiry
- Focused on conceptual understanding
- Developed in local and global contexts
- Focused on effective teamwork and collaboration
- Differentiated to meet the needs of all learners
- Informed by formative and summative assessment

Strategies to meet these approaches with students include deliberate lesson planning that encourages students to develop these approaches to learning skills:

- Thinking
- Communication
- Social
- Self-management

² IBO, 2014

- Research

ASSESSMENTS INCLUDING METHODS and/or TOOLS

(Please see Mathematical Studies SL Guide, pages 35 to 49, for more details.)

Having followed the mathematical studies SL course, students will be expected to demonstrate the following:

- *Knowledge and understanding*: recall, select and use knowledge of mathematical facts, concepts and techniques in a variety of contexts.
- *Problem-solving*: recall, select and use knowledge of mathematical skills, results and models to solve problems.
- *Communication and interpretation*: transform common realistic contexts into mathematics; comment on the context; create mathematical diagrams, graphs or constructions; record methods, solutions and conclusions using standardized notation.
- *Technology*: use technology accurately, appropriately and efficiently to explore new ideas and to solve problems.
- *Reasoning*: construct mathematical arguments through use of precise statements, logical deduction and inference, and by the manipulation of mathematical expressions.
- *Investigative approaches*: investigate unfamiliar situations involving organizing and analyzing information or measurements, drawing conclusions, testing their validity, and considering their scope and limitations.

There are ongoing formative and summative assessments throughout the course as prepared by the instructor. In addition, there are specific IB assessments called Internal Assessment (IA) and External Assessment (EA). Preparation for both the IAs and EAs are ongoing throughout the course.

IA: An individual piece of work involving the collection of information or the generation of measurements, and subsequent analysis and evaluation.

EA: Paper 1: 15 compulsory short-response questions based on the whole syllabus.
Paper 2: 6 compulsory extended response questions based on the whole syllabus.

INSTRUCTIONAL MATERIALS:

Board approved textbooks, TI-83+ graphing calculator

For Honors Distinction:

IB Mathematical Studies SL is similar in scope and rigor to Pre-Calculus Honors.

CORRESPONDING NON-HONORS COURSE:

The corresponding non-honors course is Pre-Calculus or Statistics.

DIFFERENCES in HONORS/NON-HONORS COURSES:

This course is an advanced mathematical course that combines standards from statistics and pre-calculus.

Committee Members:

1. Jamie Atwood
2. Miraluna Persik
3. Erica Huie
4. Carissa Weintraub
5. Efa Hucakby
6. David Ramirez