MT. DIABLO UNIFIED SCHOOL DISTRICT
COURSE OF STUDY

COURSE TITLE:	**IB Mathematics Standard Level**
COURSE NUMBER:	**350260**
CBEDS NUMBER:	**2463**
DEPARTMENT:	**Mathematics**
LENGTH OF COURSE:	**1 year**
CREDITS PER SEMESTER:	**5**
GRADE LEVEL(S):	**12th**
REQUIRED OR ELECTIVE:	**Required; fulfills the UC "c" for Mathematics**

PREREQUISITES:

Required -	**Passing grade in Pre-Calculus Honors**
Recommended -	**Teacher recommendation**

BOARD OF EDUCATION ADOPTION: April 17, 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 Mathematics SL guide published by the IBO, 2012.**

COURSE DESCRIPTION:
The IB Diploma Programme Mathematics Standard Level (SL) course focuses on introducing important mathematical concepts through the development of mathematical techniques. The intention is to introduce students to these concepts in a comprehensible and coherent way, rather than insisting on the mathematical rigor required for mathematics at the higher level. Students should, wherever possible, apply the mathematical knowledge they have acquired to solve realistic problems set in an appropriate context. The internally assessed exploration offers students the opportunity for developing independence in their mathematical learning. Students are encouraged to take a considered approach to various mathematical activities and to explore different mathematical ideas. The exploration also allows students to work without the time constraints of a written examination and to develop the skills they need for communicating mathematical ideas.[1]

COURSE PURPOSE:
The aims of all mathematics courses in group 5 are to enable students to:

- Enjoy mathematics, and develop an appreciation of the elegance and power of mathematics
- 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 generalization
- Apply and transfer skills to alternative situations, to other areas of knowledge and to future developments

[1] IBO, International Baccalaureate Diploma Programme Subject Brief Mathematics--Standard Level, 2014

- 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 course[2]

COURSE OUTLINE:
(Please see Mathematics SL Guide, pages 10 to 36, for more details.)

The course is divided into six topics.
Topic 1: Algebra
Topic 2: Functions and equations
Topic 3: Circular functions and trigonometry
Topic 4: Vectors
Topic 5: Statistics and probability
Topic 6: Calculus

KEY ASSIGNMENTS:
(Please see Mathematics SL Guide, pages 10 to 49, for more details.)

INSTRUCTIONS METHODS and/or STRATEGIES:
(Please see Mathematics SL Guide, pages 1 to 49, 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
- Research

ASSESSMENTS INCLUDING METHODS and/or TOOLS
(Please see Mathematics SL Guide, pages 37 to 49, for more details.)

[2] IBO, 2012

Having followed the mathematics standard level course, students will be expected to demonstrate the following.

- *Knowledge and understanding:* recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
- *Problem-solving:* recall, select and use their knowledge of mathematical skills, results and models in both real and abstract contexts to solve problems.
- *Communication and interpretation:* transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardized notation.
- *Technology:* use technology, accurately, appropriately and efficiently both 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.
- *Inquiry approaches:* investigate unfamiliar situations, both abstract and real-world, involving organizing and analyzing information, making conjectures, drawing conclusions and testing their validity.

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: Internal assessment in mathematics SL is an individual exploration culminating in a written report.

EA: External Assessment which consists of two papers, as follows:
Paper 1 (non-calculator):
Section A: Compulsory short-response questions based on the whole syllabus.
Section B: Compulsory extended-response questions based on the whole syllabus.

Paper 2 (graphical display calculator required):
Section A: Compulsory short-response questions based on the whole syllabus.
Section B: Compulsory extended-response questions based on the whole syllabus.

INSTRUCTIONAL MATERIALS:
Board approved textbooks, graphing calculator (TI-83+).

For Honors Distinction:
IB Mathematics is similar in scope and rigor to AP Calculus.

CORRESPONDING NON-HONORS COURSE:
There is no non-honors equivalent because AP Calculus is a college-level course.

DIFFERENCES in HONORS/NON-HONORS COURSES:
N/A

Committee Members:

1. Jamie Atwood
2. Miraluna Persik
4. Carissa Weintraub
5. Efa Hucakby

3. Erica Huie

6. David Ramirez