Pre IB Diploma Program Course Overview

Course Title: Pre-IB Diploma Program Mathematics
Instructor: Mr. Alei Room C-7   **Contact**: balei@desertacademy.org
Web Page: www.aleimath.blogspot.com   (505) 424-9613 (home);   (505) 699-1248 (cell)

Course Description: This course is for 10th grade student who have successfully completed Algebra 2. As such, it caters to students with a strong background in mathematics who are competent in a range of analytical and technical skills. It serves students on several paths:

Path 1	Students who wish to complete the IB Math Standard Level (SL) course at the end of their junior year. This year will be the first of the two years and students must master all material satisfactorily. Students on this path will do a complete draft of a standard level exploration.
Path 2	Students who expect to take the two year IB Math Studies course in their junior and senior years. This year will expose them to ideas that will be revisited in that course so they will not be expected to master all the material. Students on this path will do a revised version of the exploration.
Path 3	Students who expect to take the two year IB Higher Level (HL) Math course in their junior and senior years. This year will expose them to ideas that will be revisited in that course at a higher level. To continue on the path to HL, students must show an exceptional aptitude and work ethic in this course. Students on this path will do a complete draft of a high level exploration.

In short, the course will follow the IB Standard Level curriculum with different assignments, expectations and marking rubrics according to the path that each student declares. Students, with input from their parents, advisor, and the instructor, will be asked to declare which path they would like to pursue within the first two weeks of the course. Once determined, they may revise their declaration only once, at the semester break.

Course Aims: The aims of all IB diploma program mathematics courses are to enable students to:
1.   enjoy mathematics, and develop an appreciation of the elegance and power of mathematics
2.   develop an understanding of the principles and nature of mathematics
3.   communicate clearly and confidently in a variety of contexts
4.   develop logical, critical and creative thinking, and patience and persistence in problem-solving
5.   employ and refine their powers of abstraction and generalization
6.   apply and transfer skills to alternative situations, to other areas of knowledge and to future developments
7.   appreciate how developments in technology and mathematics have influenced each other
8.   appreciate the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics
9.   appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives
10. appreciate the contribution of mathematics to other disciplines, and as a particular "area of knowledge" in the TOK course.

Course Objectives: Problem-solving is central to learning mathematics and involves the acquisition of mathematical skills and concepts in a wide range of situations, including non-routine, open-ended and real-world problems. Having followed a DP mathematical studies SL course, students will be expected to demonstrate the following.
1.   **Knowledge and understanding**: recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
2.   **Problem-solving**: recall, select and use their knowledge of mathematical skills, results and models in both real and abstract contexts to solve problems.
3.   **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.
4.   **Technology**: use technology, accurately, appropriately and efficiently both to explore new ideas and to solve problems.
5.   **Reasoning**: construct mathematical arguments through use of precise statements, logical deduction and inference, and by the manipulation of mathematical expressions.
6.   **Investigative approaches**: investigate unfamiliar situations involving organizing and analysing information or measurements, drawing conclusions, testing their validity, and considering their scope and limitations.

Texts & Resources: We will use one primary source as our text. Other materials will be used as needed.
> **Haese & Harris:** (*Mathematics SL, Third Edition*). The text will be provided and an electronic copy with tutorial support is available by CD or the text only is at http://www.aleigonzalez.org/Desert/ibsl-3.pdf.
> http://aleimath.blogspot.com - My web page is updated regularly. It has homework assignments, class notes, and other resources. Bookmark it and use it regularly.

Syllabus: This course will cover the first year of the two year IB Standard Level Math syllabus. Detailed content from each area and the exploration is given in the syllabus published by IB which is available at http://www.aleigonzalez.org/Desert/math.sl.14.pdf. **Students should download this and keep it for reference over the course of their study.**

It is expected that students in Year 1 are fairly well versed in topics from Algebra 2 and any other topics in the Presumed Knowledge section of the syllabus. In this course we will study topics 1, 2, 3 & 5 (Algebra & Functions, Statistics, and Trig) and get a good start on the Exploration. In Year 2, we will finalize our Explorations and cover topics 4 & 6 (Vectors, & Calculus), while we will review and extend our understanding of the other topics.

A summary of the SL areas of study with the approximate time allocated to each area is shown.

	Topic	Hrs	Notes
Topic 1	**Algebra**	**9**	**Covered in Year 1**
Topic 2	**Functions and equations**	**24**	**Covered in Year 1**
Topic 3	**Circular functions and trigonometry**	**16**	**Covered in Year 1**
Topic 4	Vectors	16	To be studied Year 2
Topic 5	**Statistics and probability**	**35**	**Covered in Year 1**
Topic 6	Calculus	40	To be studied Year 2
	Exploration	**10**	**Draft completed Year 1**
	Total	**150**	

Methods of Assessment: Students will be assessed using both summative and formative assessments. Tests, quizzes, projects and regular oral and written problem presentations will be assessed. Please note: **assignments, assessments, and scoring rubrics will vary according to which path the student is pursuing**.

IB Exploration: All students, whether or not they are candidates for an IB certificate, will be expected to complete a version of the IB exploration. This is a short (6-12 pages) report written by the student based on a topic chosen by him or her, and it should focus on the mathematics of that particular area. The emphasis is on mathematical communication (including formulae, diagrams, graphs and so on), with accompanying commentary, good mathematical writing and thoughtful reflection. A student should develop his or her own focus, with the teacher providing feedback via, for example, discussion and interview. A draft of the exploration, worth 20% of your Desert grade, will be completed in the first year.

Late work policy: It is expected that assignments will be completed, turned in on time, and represent the student's own work. Timely completion of assignments is essential to ensuring strong class participation and optimal learning outcomes. At the discretion of the teacher, late work may be marked down 20% (one full grade.) Teachers may also, at their discretion, refuse to accept late work if it is more than10 days overdue; in such cases, the assignment may be given an 'F.'.

Grading Policy: Your grade will be based on problem presentations, quizzes, and tests (80%) and your draft Exploration (20%). Problem presentations and homework will be graded for completeness and accuracy but your grade in the course will be primarily based on your performance on quizzes and tests. These will be scored according to an IB 0-7 grading scale. At the end of each semester, a composite IB grade based on tests and quizzes will be determined. When students are on a border, their homework completion, problem presentations, and class participation will be taken into consideration.   A Desert letter grade will then be assigned according to the following mapping:
>   7 = A+   6 = A   5 = A-   4 = B+   3 = B-   2 = C-   1 = D-   0 = F

Homework Policy: Because math is best learned through regular practice, expect to have nightly homework. Unless otherwise indicated, homework is due at the beginning of the following class period. In most cases, you will be presenting one or more homework problems during class. **Homework presentations and work in class represent a significant part of your learning – doing the HW well and contributing in class is essential for your success.** The remaining problems will be spot checked for completion and collected on a random basis for explicit grading. Be prepared to hand in any homework assignment.

Absences and Tardies: Please refer to the school's absentee and tardy policies in the 2013-14 Parent Student Handbook. Note that as students arrive to class, they will select the problem(s) they wish to present on a first come, first served basis so it is to your advantage to arrive to class on time. If you are absent, you are responsible for making up the missed material on your own time. In general missed HW is due one day following your return from an absence. It is your responsibility to schedule a time to make up missed tests or quizzes. A student who is absent 5 times in one semester will receive written notification of excessive absences. A student who is absent 8 or more times may be required to complete work outlined in a written make-up plan in order to receive credit for the course.

Required Materials: Students are expected to bring the following materials to class **every day**.
- Text book (if class sets are not available)
- Math notebook. I **strongly** suggest a **graph paper notebook**, available at Staples or through me for about $3
- 3 Ring binder to help organize handouts and submitted work that has been returned to you.
- **Graphing calculator**. (TI-84Plus or TI-nSpire (**non-CAS**) recommended). Note: If you borrow a school calculator on a regular basis you may be assessed a rental fee at the end of the year. The fee will be calculated by dividing the total replacement cost of lost or negligently damaged calculators by the number of regular borrowers. Note that this fee may apply **even if you return the calculator you borrowed in good working order.**
- At least two **pencils** with good erasers.
- There is generally a class set of rulers, protractors, compasses, etc, but having your own is convenient.

Student:

I have read the entire attached course overview. Specifically, **I understand that if I borrow a school calculator on a regular basis I may be financially responsible for a rental fee to be determined at the end of the year based on the total number of lost or damaged calculators.** I agree to adhere to the policies contained within. I agree to give this class my best effort and to respect everyone within it.

_____   _____   _____

Student Name (please print)   Student Signature   Date

Parent/Guardian:

I have read and reviewed the attached course overview with my student and agree to adhere to the policies contained within. Specifically, **I understand that if my child borrows a school calculator on a regular basis I may be financially responsible for a rental fee to be determined at the end of the year based on the total number of lost or damaged calculators.**

_____   _____   _____

Parent Name (please print)   Parent Signature   Date

Three things I would like you to know about my child:

1.) _____

2.) _____

3.) _____

Please check if the statement below if it applies to you and your student (will be kept confidential):

_____ We do not have internet/email access at home.

Please indicate which path you expect to pursue. Note: This indication is **not binding**. Rather, it will help to determine the diversity of interest in the class and allow better planning.

Check one		
	Path 1	I want to complete Math SL at the end of my junior year.
	Path 2	I want to complete Math Studies in my junior and senior years.
	Path 3	I want to complete Math HL in my junior and senior years.
	Other	I'm really not sure – I want to see how things go.