**Course Title: IB PreCalculus**

**School Year: 2015-16**

**School: Pueblo East High School**

**Instructor: Rochelle Maes**

**Instructor Contact Information:** [**rochelle.maes@pueblocityschools.us**](mailto:rochelle.maes@pueblocityschools.us)

**719-423-3918**

1. **Course description:**

IB Pre-Calculus is the first year of a two year program for the standard level of the IB program. This program caters to students who anticipate a need for a sound mathematical background in preparation for their future studies. The 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. Students should, wherever possible, apply the mathematical knowledge they have acquired to solve realistic problems set in an appropriate context. The internally assessed component (completed during the 2nd year) , the 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. Students enrolled in this course are expected to sit for the IB exam the following year. As an Honors course, students will receive those quality points.\*

1. **Aims of the Course:**

The aims of all mathematics courses in group 5 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.
11. **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 mathematics 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. **Inquiry approaches:** investigate unfamiliar situations, both abstract and real-world, involving organizing and analyzing information, making conjectures, drawing conclusions and testing their validity.
7. **IB Learner Profile Attributes and Internationalism:**

The IB learner profile encourages learning by experimentation, questioning and discovery. In the IB classroom, students should generally learn mathematics by being active participants in learning activities rather than recipients of instruction. Students will be encouraged to view mathematics as a universal language.

1. **Connections to Theory of Knowledge:**

As students come to appreciate and acknowledge how mathematics is and has been used universally for centuries to make sense of the world in which we live, they will begin to understand the connections between mathematics and their environment as well as how mathematical knowledge frames much of our thinking.

1. **Course Outline:**

***IB Precalculus is the 1st year of a 2 year program to test SL***

|  |  |
| --- | --- |
| **Syllabus Component** | **Hours of Instruction** |
| **Algebra** | 9 |
| **Functions and Equations** | 24 |
| **Circular Functions and Trigonometry** | 16 |
| **Vectors** | 16 |
| **Statistics & Probability** | 35 |
| **Calculus** | 40 |
| **Mathematical exploration-Completed during year 2**  Internal assessment in mathematics SL is an individual exploration. This is a piece of written work that involves investigating an area of mathematics. | 10 |
| **Total Teaching Hours** | 240 |

**VII. Unit Sequence for this Course:**

IB PreCalculus Year 1

|  |  |
| --- | --- |
| *Unit or Topic of Study* | *Approximate Time Frame* |
| *Algebra and Functions* | 10 weeks |
| *Probability* | 4 weeks |
| *Exponents and Logarithms* | 3-4 weeks |
| *Rational Functions* | 2 weeks |
| *Patterns, Sequences and Series* | 2-3 weeks |
| *Limits and Derivatives* | 5 weeks |
| *Descriptive Statistics* | 5 weeks |

1. **Course Texts Book:**

Mathematics Standard Level, (2012), Buchanan, Fensom, Kemp, Rondie, Stevens

1. **Assessment:**

Grading Categories: \*Honors Grading Scale

*Summative:*

60%-Chapter Tests and Semester Final 92%-100% A

82%-91% B

*Formative:* 72%-81% C

10%-Internal Assessment Exploration 65%-71% D

30%-Homework Quizzes 65%< F

**LATE WORK WILL NOT BE ACCEPTED.** Students may turn in work that was missed due to an excused absence only.

**CHEATING OF ANY KIND WILL NOT BE TOLERATED AND WILL RESULT IN A GRADE OF ZERO AND LOSS OF CHANCE TO RE-TEST/SUBMIT.**

**Attendance and Tardies:**

Attendance is required. There is a direct correlation between high student achievement and good attendance.

Absences: Please refer to the **East High School Handbook** for school policy regarding absences from school. Extended absences will be reviewed on an individual basis. In the case of an **excused** absence on a test day, the student must take the missing test the day of return to school. Make-up work will only be allowed for **excused** absences.

Tardies: Students are expected to be in their seat when the tardy bell rings. In the event that they are late in excess of 5 times during a semester, they will be referred to the Assistant Principal.

**Behavior:**

Respect is expected at all times for the instructor, substitute instructor, all students and their ideas. Please refer to the **Pueblo City Schools Student Conduct Code.**

**Please Note:**

It is recommended that students purchase a graphing calculator for use in the course as one is required for the IB exam. Texas Instruments models TI-83+ and TI-84, are reasonably priced and powerful and should last your student through their college years. There will be a limited number available for classroom use. Please contact me if you have questions.

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