RIVERSTONE INTERNATIONAL SCHOOL
Inspiring the Journey

Pre-AA Mathematics (9/10)

Instructor Information

Instructor: Ethan Treadwell

Email: etreadwell@riverstoneschool.org

Course Description

This course recognizes the need for analytical expertise in a world where innovation is increasingly dependent on a deep understanding of mathematics. This course includes topics that are both traditionally part of a pre-university mathematics course (for example, functions, trigonometry, calculus) as well as topics that are amenable to investigation, conjecture and proof, for instance the study of sequences and series. The course allows the use of technology, as fluency in relevant mathematical software and hand-held technology is important regardless of choice of course. The course also has a strong emphasis on the ability to construct, communicate and justify correct mathematical arguments. It is expected that most students in this course will be enrolled in Mathematics Analysis and Approaches in the diploma program and test at the Higher Level (HL) in their senior year.

Prerequisites

None

Materials

- Textbook: Mathematics: Analysis and Approaches **Higher Level**. Oxford University Press.
    - Digital only version

- **TI-Nspire CX II** calculator is required for this course
    - This is required for this and further courses

Assessment

- Paper 1: 30%
- Paper 2: 30%
- Internal Assessment: 20%
- Process Work 5%
- Final Exam: 15%

Class Schedule

Unit 1: Sequences, series, and proofs [8 weeks]

- Sequences, series, and sigma notation
- Arithmetic and geometric sequences and series
- Permutations, Combinations, and the Binomial Theorem

Unit 2: Functions [8 weeks]

- Functional relationships
- Special functions and their graphs
- Classification of functions
- Operations with functions
- Function transformations

Unit 3: Geometry and Trigonometry [8 weeks]

- Properties of three-dimensional space
- Angles of measure
- Trigonometric ratios and identities
- Trigonometric functions

Unit 4: Probability and Statistical Distributions [8 weeks]

- Axiomatic probability systems
- Probability distributions
- Continuous random variables

- Binomial distribution
- The normal distribution

Internal Assessments

- Quizzes
- Unit Exams: IB Questions
- Spring Semester Final: **Cumulative** exam with IB questions

Policies

- **Late Work: No late work will be accepted.** If you are absent from school, please upload the assigned work to ManageBac. Occasional missed homework assignments will **not** have a significant impact on your grade. Extended absences and extenuating circumstances will be considered on a case-by-case basis in conjunction with the High School Coordinators.
- **Exam Retake:** Students will not be allowed to retake or edit their exams after the assigned testing period.
- **Exam Notes:** IB Data Booklet
- **AI Use Guidelines:** Math and Sciences are grounded in inquiry, problem-solving, and individual understanding of complex systems. AI tools should not be used, nor should they be needed, unless explicitly instructed use is permitted by the instructor. AI tools may be utilized to brainstorm concepts to be researched at the beginning of the research process, but should not be used further beyond that.
- Attendance Policy
- Academic Integrity Policy
- Grade Appeal Policy

Resources and Support

- Office Hours: Please come in anytime during B&E or afterschool by appointment for additional help.
- Online Platforms: Riverstone provides all students with access to Oxford Study Companion (OSC), available via ManageBac.

Grading Scale

Although this mathematics course is intended for MYP students, it primarily draws from the IB DP mathematics curriculum and as such grades will be awarded on a 1-7 scale. When considering

marking a student's work, it is imperative that teachers take the IB recommendations on how to assess a student fully into consideration.

- An emphasis on criterion-related (as opposed to norm-referenced) assessment.
- Valuing the most accurate demonstration of student performance, rather than just averaging attainment grades over a reporting period
- Examining student understanding at the end of the course, based on the whole course and not just aspects of it
- IB grade boundaries published after each examination session. This helps the teacher to measure a students ability numerically and compare that result to historical results.

Please see the descriptions below to understand what it means for a student to earn a specific IB number grade.

DP Grade boundaries for each subject (in progress)

IB Grade	Grade Boundary	Grade Translation	GPA Points	Grade Descriptor
7	Each Diploma Program class has different grade boundaries.. These are updated into each individual Managebac class in alignment with the DP guidance by group and subject. Please check your student's grade in Managebac and you can use this table to convert to A-F and the 4.0 GPA scale.	A+ A	4.0	Consistently produces innovative work demonstrating insight into the task beyond what was addressed in class. The work exemplifies a high degree of accuracy without the assistance of the teacher. Consistently demonstrates novel and creative ideas to transfer knowledge and skills to complex classroom topics as well as real-world situations.
6		A	4.0	Sometimes produces innovative work demonstrating insight into the task beyond what was addressed in class. The work is satisfactory to the task representative of a thorough understanding of the knowledge and skill necessary to carry out similar work that might be unfamiliar.
5		A- B+	3.75 3.5	Produces generally high quality work representative of attempts to apply critical thinking. Demonstrates a sound knowledge and understanding of the subject using subject-specific terminology. When introduced to unfamiliar concepts, knowledge and skills are attempted to be used in application, but requires some assistance.
4		B B-	3.25 3.0	Produces good quality work representative of a basic understanding of concepts addressed within the context of class. Demonstrates an adequate usage of subject specific terminology limited to items discussed within the class setting. Application to real-world settings requires significant assistance.
3		C+ C C-	2.75 2.25 2.0	Produces work of acceptable quality. Inability to use subject specific terminology reveals gaps in understanding or misunderstandings. There are some attempts at creative and critical thinking with support, but ultimately unable to make conceptual leaps in the real-world.
2		D	1.0	Produces work of limited quality. Infrequent demonstration of understanding with very little to no use of subject specific terminology. Even with support provided, there is little effort to think critically.
1		F	0.0	Insufficient evidence to assess student work.

Note

This syllabus is subject to change at the instructor's discretion. Any changes will be communicated to students in a timely manner.