



Tohoku International School

Secondary School Course Syllabus

Course Title: Mathematics: Applications and Interpretation Standard Level (SL)	Teacher: Mr. Zane Clifford Email: zclifford@tisweb.net
Level: Grade 11-12	Time Frame: Two years (2021-2023)
Brief Course Description: <p>The key concepts in the Mathematics: Applications and Interpretation course are measurement, modeling, and working with data (collecting, analyzing, and communicating conclusions). This course explores in greater depth many of the topics already encountered in earlier Math courses at TIS, including algebra, functions, geometry, trigonometry, statistics and probability. It will also introduce students to some of the fundamental ideas of calculus.</p>	
Course Philosophy: <p>How can a town with four fire stations be divided into regions so that the nearest fire truck is dispatched to the fire location? How can we tell if the oceans are warming? How can a lawyer make sure that a jury understands evidence based on probabilities? How can meteorologists estimate the area likely to be affected by a hurricane? Answering these questions requires tools that let us measure, understand and interpret real world data so as to improve our lives and the lives of those around us.</p> <p>Students will develop their abilities to understand and solve mathematical problems, think critically, and communicate ideas clearly. As students explore the material presented in this course, they should begin to see the connections and applications between mathematics and the world around them. Students who complete this two-year course successfully should do well on the IB DP Mathematics Examination at the end of Grade 12, as well as higher Math courses in college.</p>	
Units of Study – Year 1 (2021-2022) <ol style="list-style-type: none"> 1. Measuring Space: Accuracy and 2D Geometry 2. Representing Space: Non-right Angled Trigonometry and Volumes 3. Representing and Describing Data: Descriptive Statistics 4. Dividing up space: coordinate geometry, lines, Voronoi diagrams 5. Modelling constant rates of change: linear functions 6. Modelling relationships: linear correlation of bivariate data 7. Quantifying uncertainty: probability, binomial and normal distributions Units of Study – Year 2 (2022-2023) <ol style="list-style-type: none"> 8. Testing for Validity: Spearman's, hypothesis testing and χ^2 test for independence 9. Modelling relationships with functions: power functions 10. Modelling rates of change: exponential and logarithmic functions 11. Modelling periodic phenomena: trigonometric functions 12. Analysis rates of change: differential calculus 13. Approximating irregular spaces: integration 	
TIS Assessments: <u>Projects – 30%</u> <p>Some units will feature projects that will require the students to apply the skills learned in the unit to a real world problem, and present their findings to the class.</p> <u>Quizzes – 20%</u> <p>Throughout each unit, students will be required to complete shorter written assessments (10-25 min).</p> <u>Tests – 40%</u> <p>At the end of each unit, there will be a longer written assessment (45-min).</p>	

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Mathematics: Applications and Interpretation Standard Level (SL)

Learning Skills – 10%

Attendance, organization, completion of course work and the ability to take initiative and work productively in various settings all play a role in student success and are important for achieving the course expectations. Students will be observed throughout the year in order to determine an accurate assessment of these skills, according to the TIS Learning Skills rubric.

IB Assessments:

External Assessments

- Paper 1 – 40%
- Paper 2 – 40%

Internal Assessment

Mathematical Exploration - 20%

Course Specific Materials Required

- Graphing calculator (TI-84 Plus or equivalent)
- Pencils, erasers, etc.
- Graph paper notebook
- Homework/handout folder
- Ruler/straightedge
- Textbook: *Mathematics: Applications and Interpretations Standard Level (SL)*, Wathall et al.

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