

# COURSE SYLLABUS

**Course Title: Mathematics  
(10<sup>th</sup> Grade, Upper-Intermediate)**

The Asian International School

## INSTRUCTIONAL RESOURCES

- Upper-Intermediate Mathematics Module
- Worksheets

## LEARNING OUTCOMES

Upon successful completion of this course, the student will be able to:

- Solve problems using both plane trigonometry and trigonometry in the circle.
- Understand and work with vectors and their basic operations.
- Collect real-world data and calculate basic statistics on real-world data.

## COURSE REQUIREMENTS

In order to take this course:

- A scientific calculator will be useful for performing calculations.
- Access to a computer with one of the following programs will be useful:
  - [GeoGebra](#) (Free)
  - [Mathematica](#) (Paid)
  - [GNU Octave](#) (Free)
  - [MATLAB](#) (Paid)

## I. COURSE SCHEDULE

MONTH/ CHAPTER	UNIT TITLE	LEARNING OUTCOMES	TIME FRAME	NOTES
<b>SEMESTER 1</b>		<b>18 WEEKS</b>		
AUG./ CHAPTER 1: Basic Trigonometry	Unit 1: Pythagorean Theorem	<ul style="list-style-type: none"><li>• Define and understand the concept of Pythagorean theorem</li><li>• Calculate the measure of the unknown side of a right triangle</li><li>• Use the special right triangle to calculate the unknown sides of a right triangle</li></ul>	4 weeks	

SEP./ Chapter 1: Basic Trigonometry	Unit 2: Trig Functions and Ratios Unit 3: Trig Identities	<ul style="list-style-type: none"> <li>Understand and derive fundamental identities</li> <li>Simplify trigonometric expressions</li> </ul>	4 weeks	
OCT./ Chapter 1: Basic Trigonometry	Chapter 1: Unit 4: Inverse Trig Functions Comprehensive Project	<ul style="list-style-type: none"> <li>Understand how the inverse trig functions work.</li> <li>Be able to solve standard and word problems using the inverse trig functions</li> <li>Students will demonstrate their functional knowledge of the material from Chapter 1.</li> </ul>	4 weeks	<b>Mid-Term Exam</b>
NOV -DEC./ Chapter 2: Trigonometry in the Circle	Unit 1: Arcs and Angles Unit 2: Trigonometric Functions in the Circle Comprehensive Project	<ul style="list-style-type: none"> <li>Define unit circle</li> <li>Determine the degree and radian measure of a given angle in a unit circle</li> <li>Determine the measure of an arc in a unit circle Draw and represent a given arc in a circle</li> <li>Define the 6 trigonometric functions in a unit circle</li> <li>Calculate values of trigonometric functions of a given angle</li> </ul>	6 weeks	<b>Final Exam and Vietnamese Exam</b>
<b>SEMESTER 2</b>		<b>16 WEEKS</b>		
JAN./ Chapter 3: Vectors	Unit 1: Concepts of Vectors	<ul style="list-style-type: none"> <li>Define and understand the concept of vectors</li> <li>Illustrate geometrically parallel vectors and vectors with the same direction</li> <li>Define and understand equal and zero vectors</li> </ul>	4 weeks	

FEB./ Chapter 3: Vectors	Unit 2: Addition and Subtraction of Vectors  Unit 3: Dot Product and Cross Product of Vectors	<ul style="list-style-type: none"> <li>Define and understand vector sum</li> <li>Perform addition and subtraction of vectors</li> <li>Define and understand the properties of dot products of two vectors</li> <li>Define and understand the properties of cross products of two vectors</li> <li>Understand how dot product relates to parallel vectors</li> </ul>	2 weeks	
MAR./ Chapter 3: Vectors  Chapter 4: Statistics	Review for Midterm Exam  Unit 1: Frequency and Relative Frequency of Tables	<ul style="list-style-type: none"> <li>Set up an ungrouped frequency and relative frequency table of a given data</li> <li>Set up a grouped frequency and relative frequency table of a given data</li> <li>Create the graph of a given frequency table or relative frequency table</li> </ul>	4 weeks	<b>Midterm Exam</b>
APR./ Chapter 4: Statistics	Unit 2: Measures of Central Tendencies and Dispersion  Comprehensive Project  Review for Final Test	<ul style="list-style-type: none"> <li>Define and understand the different measures of central tendencies</li> <li>Determine the mean, median, and mode of a given ungrouped data</li> <li>Define and understand the concept of variance and standard deviation</li> <li>Set up a column for deviation from the mean of a given set of data</li> <li>Calculate the variance and standard deviation of a given data set</li> </ul>	6 weeks	<b>Final Exam and Vietnamese Exam</b>
TOTAL: 4 Chapters – 12 Units			<b>32 WEEKS</b>	