**mathematics COURSE DESCRIPTION**

**WHAT IS THE COURSE ABOUT?**

Mathematics plays an essential role both within the school and in society. It promotes a powerful universal language, analytical reasoning and problem-solving skills that contribute to the development of logical, abstract and critical thinking. MYP mathematics aims to equip all students with the knowledge, understanding and intellectual capabilities to address further courses in mathematics, as well as to prepare those students who will use mathematics in their workplace and life in general.

MYP mathematics outlines five branches of mathematical study: **numbers**, **algebra**, **geometry and trigonometry**, **statistics and probability** and **discrete mathematics.**

**The school offers four lessons of mathematics per week.**

Literature:

P.Vollmar, M.Haese, R.Haese, S.Haese, M.Humphries: *Mathematics for the international student, MYP4*, Haese & Harris publications

A.McSeveny, R,Conway, S.Wilkes, M.Smith: *international Mathematics for the Middle Years 5;* Pearson

**TOPICS:**

**MYP4**

**NUMBERS AND ALGEBRA**

**Why do we need algebra?**

 - algebraic notation

 - linear equations and inequalities

 - scientific notation

 - algebraic expansion and simplification

 - problem solving and applied problems

**COORDINATE GEOMETRY AND SIMULTANEOUS EQUATIONS**

**How coordinates can help us to understand issue better?**

 - rectangular coordinate system; distance between two points; midpoints

 - equation of straight line, parallel and perpendicular lines

 - linear simultaneous equations

 - problem solving that can be reduced to linear simultaneous equation

**TRIGONOMETRY AND TRANSFORMATION GEOMETRY**

**How far is the moon and how large it is?**

- trigonometric ratios in right triangle

- solving some real life situations concerning angles and distances

- formal language of transformations, such as translation*,* reflection*,* and rotation

- working with transformations and combinations of transformations in the Cartesian plane

**FURTHER ALGEBRA AND QUADRATIC EQUATION**

**Can you solve my equation?**

 - algebraic fractions

 - manipulation with algebraic fractions

 - quadratic formula

 - solving problems using quadratic equations

**STATISTICS AND PROBABILITY**

**What are your survival prospects?**

 - mean, median and mode: calculations with grouped/continuous data

 - measuring the spread of data

 - probability of an event

 - using tree diagrams to determine the probability

 - applying statistical and probabilistic approach in real life situations

**MYP5**

**Probability**

**What are my chances?**

- probability of an event

- probability of exclusive and combined events

- using tree diagrams to determine the probability of repeated events

**Number Plane Graphs**

**How can graphs help us understand the issue better?**

 - graphing quadratic, cubic and rational functions

- using different forms of quadratic function

- finding minimum/maximum value of a quadratic function

- using equation of a circle

- solving simultaneous equations algebraically and graphically

- applying functions in real life situations

**Geometry and/or Trigonometry**

**How can we combine geometry and trigonometry to solve complex problems?**

- determining surface area and volume of a 3D object

- solving triangles using sine and cosine rule

- solving some 3 dimensional problems using geometry and trigonometry

**Exponential and logarithmic function**

How to measure earthquakes?

- exponential functions and their graphs

- logarithmic functions and their graphs

- laws of logarithms

- solving exponential and logarithmic equations and inequalities

- applying exponential and logarithmic functions in real life situations

**Statistics**

**What are your survival prospects?**

- comparing sets of data

- using standard deviation

- applying statistical approach in real life situations

**Algorithms and Number Theory**

**How are step-by-step instructions for a task developed?**

- algorithms

- absolute value and division algorithm

- divisibility and Euclidian algorithm

- properties of gcd

**ASSESSMENT:**

-written tests

 -homework

 -oral exams through particular individual questions during the lessons

Students are assessed according to the prescribed (MYP5) and interim (MYP4) descriptors for grading. The students are given task specific descriptors together with each task.

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| Criterion A | Knowledge and understanding | Maximum 8 |
| Criterion B | Investigating patterns | Maximum 8 |
| Criterion C | Communication in mathematics | Maximum 6 |
| Criterion D | Reflection in mathematics | Maximum 6 |

At the end of the school year points are given in each criteria taking into account achievements in all individual tasks (formative and summative assessment).

Final grades are derived according to the interim grade boundaries (MYP 4) or grade boundaries provided by the IB (MYP 5):

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| **MATHETAMTICS**  |
| GRADE | BOUNDARIES  |
| 1 | 0-4 |
| 2 | 5-8 |
| 3 | 9-12 |
| 4 | 13-17 |
| 5 | 18-21 |
| 6 | 22-25 |
| 7 | 26-28 |