



Katedralskolan Skara IB Diploma Programme



Mathematics Standard Level/Higher Level (2014)

General course description

Mathematics can be, and are at an increasing level used to describe, predict and create models of various topics in everyday life as well as in professional life. Knowledge about and ability to use mathematics is therefore essential.

The SL course is intended for students who already possess knowledge of basic mathematical concepts. The majority of these students are expected to need a sound mathematical background as they prepare for future studies in subjects such as chemistry, economics, psychology and business administration.

The HL course is intended for students who possess a good background in mathematics and who are competent in a range of analytical and technical skills. The majority of these students will be expecting to include mathematics as a major component of their university studies, either as a subject in its own right or within courses such as physics, engineering and technology. Others may take this subject because they have a strong interest in mathematics and enjoy meeting its challenges and engaging with its problems.

Among the aims of the course we especially emphasize the following:

- Enable student to formulate a mathematical argument and communicate it clearly and confidently in a variety of ways.
- Enable the students to develop logical, critical and creative thinking and develop patience and persistence in problem solving
- Enable the students to appreciate the contribution of mathematics to other disciplines and an awareness of the international, multicultural and historical dimensions of the subject

Having followed the course, students are expected to be able to:

- recall, select and use their knowledge in a variety of familiar and unfamiliar contexts.
- use technology, accurately, appropriate and efficiently both to explore new ideas and to solve problems, read, interpret and solve a given problem using appropriate mathematical terms



Katedraliskolan Skara IB Diploma Programme



- conduct problem-solving by recalling, selecting and use their knowledge of mathematical skills, results and models in oth real-world and abstract contexts.
- investigate unfamiliar situations, both abstract and real-world, analysing information, making conjectures, drawing conclusions and testing their validity.

Topics SL/HL

All topics of the courses are compulsory.

Teaching hours

• Algebra	9 /30
• Functions and Equations	24 /22
• Circular functions and trigonometry	16 /22
• Vectors.	16 /24
• Statistic and probability	35/36
• Calculus	40/48
• Exploration	10 /10
➤ On piece of work exploring an area of interest written by the student self.	
• Option, only for HL. Students must study <u>one</u> of the following options.	
➤ Statistics and probability, Sets, relations and groups; Calculus or Discrete mathematics	-/48
Sum	150/240

Methods

The intention is to introduce mathematical concepts through the development of mathematical techniques in a comprehensible way, rather than insisting on complete mathematical rigor for the SI students.

The HL course focuses more on developing important mathematical concepts in a comprehensible, coherent and rigorous way. Development of each topic feature justification and proof of results thus enabling the students to develop insight into mathematical form and structure.

Wherever possible the mathematical knowledge that student has acquired should be used to solve realistic problems set in an appropriate context.

Student will work individually and/or in groups with textbook exercises or problem solving activities during regular classes. As the students becomes more familiar with a topic they are encouraged to become more independent as inquirers and more reflective and also more comfortable as risk-takers

Students will be given tests after a suitable part of a topic is covered.



Katedralskolan Skara IB Diploma Programme



Student will have access to computers and GDC throughout the course. Tests are divided in two parts with and without GDC

The exploration is a piece of work that involves investigating an area of mathematics. The area is chosen by the student. The exploration offers a great opportunity to develop the students curiosity, communicating skills, open-mindedness and reflectiveness.

Link to core (CAS/ TOK)

By making the students aware of the universality of mathematics as a means of communication, students develop their understanding for the international dimension of mathematics

As oppose too many other subjects mathematics, as a field of knowledge seem to supply a certainty missing in other subjects. Through discussions about, proof, axiom, and the question whether mathematics is invented or discover, applied mathematics in natural- and human sciences versus pure mathematics the studies in mathematics are linked to the Theory of Knowledge.

Assessment SL

External assessment Two written papers **80%** of total grade

Paper 1 1 h 30 min **40%** of total grade
No calculator allowed

Paper 2 1 h 30 min **40%** of total grade
Graphic display calculator (GDC) required

Internal assessment **20%** of total grade

The internal assessment consists of one piece of work that are internally assessed, by the teacher and externally moderated.



Katedralskolan Skara IB Diploma Programme



Assessment HL

External assessment	Three written papers	80% of total grade
Paper 1	2 h	30% of total grade
No calculator allowed		
Paper 2	2 h	30% of total grade
Graphic display calculator (GDC) required		
Paper 3 Option	1 h	20% of total grade
Graphic display calculator (GDC) required		

Internal assessment **20%** of total grade

The internal assessment consists of one piece of work that are internally assessed, by the teacher and externally moderated.

Course material/Textbook

L Buchanan, J Fensom, E Kemp, P La Rondie and J Srevens, *Mathematics Standard Level course companion* (2012). Oxford University Press

J Fensom, J Harcet, L Heinrichs et al *Mathematics Standard Level course companion* (2012). Oxford University Press

Teacher and email

Håkan Lodin, hakan.lodin@skara.se

Further information

[Link to Diploma Programme Curriculum briefs](#)