

Geitonas School

International Baccalaureate Diploma Programme

An outline of the CHEMISTRY course

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Course Structure

The Chemistry course is taught in two years time, actually in five terms since during the sixth term of the second year, all the IB students are taking their final Diploma Exams. The syllabus and the requirements are different for the Chemistry Standard and High Level courses, and therefore we offer separate classes for the two levels unless the size of the classes is very small.

Course Topics

The **Core material** is compulsory and is divided into 11 topics. The **Optional Material** usually consists of two of the following topics: "Environmental Chemistry", "Human Biochemistry", and "Medicines and Drugs"

Core Material

1. Measurement and data processing
2. Quantitative Chemistry
3. Atomic theory
4. Periodicity
5. Bonding
6. Energetics
7. Kinetics
8. Equilibrium
9. Acids and bases
10. Oxidation and reduction
11. Organic chemistry

Optional Material

1. Environmental Chemistry (SL)
Air pollution, acid deposition, greenhouse effect, ozone depletion, dissolved oxygen in water, water treatment, soil, waste
2. Medicines and Drugs (SL/HL)
Pharmaceutical products, antacids, analgesics, depressants, stimulants, antibacterials, antivirals. HL: Drug action, drug design, mind-altering drugs
3. Human Biochemistry (HL)
Energy, proteins, carbohydrates, lipids, micro/macronutrients, hormones, enzymes, nucleic acids, respiration

Assessment

The student's official assessment consists of the External Assessment (three written papers) and the Internal Assessment (experimental investigations and Group 4 Project). Students are also assessed internally through quizzes, tests, term-, mock-, and year-exams.

External Assessment

The official final grade for the Chemistry module consists 76% of the External Assessment grade and 24% of the Internal Assessment.

CHEMISTRY DETERMINATION OF FINAL GRADE		
	SL	HL
External Assessment		
Paper 1	20%	20%
Paper 2	32%	36%
Paper 3	24%	20%
	76%	76%
Internal Assessment (IA)		
Investigations & Group 4 Project	24%	24%
Total	100%	100%

The external assessment consists of three written papers. A Chemistry Data Booklet is provided to the students for papers 2 and 3.

External Assessment Specifications for STANDARD level					
Component	Duration	Points	Overall weighing	Format	Syllabus Coverage
Paper 1	45 min	30	20%	30 multiple-choice questions	Core
Paper 2	1 h & 15 min	50	32%	<i>Section A:</i> one data-based question and several short answer questions <i>Section B:</i> one extended response question from a choice of three	Core
Paper 3	1 h	40	24%	Short-answer questions	Options

External Assessment Specifications for HIGHER level					
Component	Duration	Points	Overall weighing	Format	Syllabus Coverage
Paper 1	60 min	40	20%	40 multiple-choice questions	Core
Paper 2	2 h & 15 min	90	36%	<i>Section A:</i> one data-based question and several short answer questions <i>Section B:</i> two extended response questions from a choice of four	Core
Paper 3	1 h & 15 min	50	20%	Short-answer questions	Options

Internal Assessment (IA)

Investigations

Chemistry students are required to have completed a practical scheme of work consisting of short single lab sessions or more complex and lengthy mini-projects. The experiments cover most of the syllabus topics. Students have to do additional work at home to analyze and present the data collected during these lab sessions in a form of a lab report. The lab work, practical work and lab report, are assessed according to specific criteria and is externally moderated.

Group 4 Project

The Group 4 Project is an interdisciplinary project on a common theme carried out by students of all three natural sciences taught in our school (Physics, Chemistry, Biology) of both standard and high level. This project allows students to understand the limitations of scientific study, for example, the shortage of appropriate data and/or the lack of resources. The emphasis is on interdisciplinary cooperation and the processes involved in scientific investigation, rather than the products of such investigation. The project usually lasts two-three days and parts or all of the work may be carried out in the school labs, outdoors or combined with an excursion.

School Internal Assessment

Students are assessed internally in our school throughout the two years of the IB programme. The assessment aims to the continuous supervision of a student's progress by a wide range of assessment tools.

The table below shows how the Term Grades and the Final IB1 Grade are determined. The grades of quizzes, tests, mid-term exams and mock exams are taken into account under "tests".

The IB scale (1-7) is used for all Exam, Term and Final Grades.

CHEMISTRY					
Determination of Term Grades and IB1 Final Grade					
Term Exam	Tests	Homework	Oral	Total 1st Term Grade	% to Final IB1 Grade
40%	30%	20%	10%	=100%	10%
Term Exam	Tests	Homework	Oral	Total 2nd Term Grade	% to Final IB1 Grade
40%	30%	20%	10%	=100%	30%
End of Year Exam	Internal Assessment (lab work)			Total 3rd Term Grade	% to Final IB1 Grade
80%	20%			=100%	60%
Final IB1 Grade =					100%

Bibliography

Required books

- Lanna Rerry et al., *Chemistry for use with the IB Diploma Programme (Standard/Higher Level)*, Pearson-Heinemann, ISBN SL:978 0 7339 9375 6 / HL: 978 0 7339 9380 0 (Books written for IB students covering all the Core syllabus in detail. The main textbooks used by the students)
- Geoff Neuss, *Chemistry for the IB Diploma*, IB Study Guide **2nd edition**, Oxford University Press, ISBN 0-19-915142-3 (a study guide very useful for revision)
- *Lab Logbook Designed for the IB Diploma Programme*, Association for Concurrent Learning, (a logbook helping students to keep organized notes during experimental investigations and self-assessment forms for self- or peer-evaluation of the students lab reports on all required criteria.) Available from the IB department.

Recommended books

IB Diploma specific

- John Green and Sadru Damji, *Chemistry*, **3rd edition**, IBID Press, ISBN 978 1 876659 08 0 (A book written for IB students covering all the syllabus in detail.)
- Geoffrey Neuss, *IB Diploma Programme: Chemistry Course Companion*, Oxford University Press, ISBN 978-0-19-915146-2 (A book written for IB students covering briefly all the syllabus.)

General textbooks

- *Chemistry*, 6th edition, Steven S. Zumdahl, Susan A. Zumdahl, Boston : Houghton Mifflin Company, ISBN 0-618-63982-9 (a well know Chemistry textbook with many illustrations, examples and exercises)
- M. Clugston, R. Flemming, *Advanced Chemistry*, Oxford University Press, ISBN 0-19-914633-0 (mainly used by high level students, can also be useful to standard level students)

Additional library resources

- *CRC handbook of chemistry and physics : a ready-Reference book of Chemical and Physical data*, editor - in - chief David R. Lide.
- *Chemistry: the central science*, Brown, LeMay, Bursten, Upper Saddle River, N.J. : Prentice Hall.
- *Advanced organic chemistry : Reactions, mechanisms, and structure*, Jerry March, NY : John Wiley & Sons.
- *Organic chemistry*, Robert Thornton Morrison, Robert Neilson Boyd, New Jersey : Prentice Hall.
- *A - level chemistry*, E. N. Ramsden, Ellenborough House : Stanley Thornes.
- *Chemistry data book*, J. G. Stark, H. G. Wallace, London : John Murray.
- *Chemistry*, Raymond Chang, New York : McGraw - Hill.
- *Chemistry : Study guide*, Bob McDuell, London : Letts Educational.
- *Advanced chemistry through diagrams : A level*, Michael Lewis, Oxford : Oxford University Press.
- *3000 solved problems in organic chemistry*, Estelle K. Meislich, Herbert Meislich, Jacob Sharefkin, Hightstone : McGraw-Hill, Inc.