



Tohoku International School

Secondary School Course Syllabus

Course Title: Diploma Programme Chemistry SL & HL	Teacher: Mrs. Aria Shimada Email: ashimada@tisweb.net
Level: Grade 11 (21-22) Grade 12 (22-23)	Time Frame: 2 years
Course Description: <p>Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It seeks to identify trends and patterns in these interactions. The DP chemistry course allows students to develop a wide range of practical skills and to increase facility in the use of mathematics. It also allows students to develop interpersonal, information and technology skills, which are essential to life in the 21st century. Apart from being a subject worthy of study in its own right, chemistry is often a prerequisite for many other courses in higher education, such as medicine and biological science and environmental science.</p> <p>Chemistry is taught practically. Both theory and practical work are undertaken by all students. Students have opportunities to design investigations, collect data, develop manipulative skills, analyse results, collaborate with peers and evaluate and communicate their findings. The investigations may be laboratory-based or they may make use of simulations and data bases.</p> <p>Through studying this science subject students should become aware of how scientists work and communicate with each other. Students will develop the skills to work independently on their own design, but also collaboratively to mirror the way in which scientific research is conducted in the wider community. In addition, through the overarching theme of the “Nature of Science” (NOS) this knowledge and skills will be put into the context of the way science and scientists work in the 21st century and the ethical debates and limitations of creative scientific endeavour.</p>	
Course Aims: <p>The aims of the chemistry course at SL and HL are to enable students to:</p> <ol style="list-style-type: none">1. appreciate scientific study and creativity within a global context through stimulating and challenging opportunities2. acquire a body of knowledge, methods and techniques that characterize science and technology3. apply and use a body of knowledge, methods and techniques that characterize science and technology4. develop an ability to analyse, evaluate and synthesize scientific information5. develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities6. develop experimental and investigative scientific skills including the use of current technologies7. develop and apply 21st century communication skills in the study of science8. become critically aware, as global citizens, of the ethical implications of using science and technology9. develop an appreciation of the possibilities and limitations of science and technology10. develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.	

Tohoku International School:

A community of learners preparing for life in an evolving global society



Tohoku International School

Secondary School Course Syllabus

Units of Study:

Higher Level students study all of the Standard Level content (Core), as well as additional content (AHL).

	Standard Level (SL)	Higher Level (HL)
Topics	Core 1. Stoichiometric relationships 2. Atomic structure 3. Periodicity 4. Chemical bonding and structure 5. Energetics/thermochemistry 6. Chemical kinetics 7. Equilibrium 8. Acids and bases 9. Redox processes 10. Organic chemistry 11. Measurement and data processing	Core (1-11) Additional higher level (AHL) Topics 12. Atomic structure 13. The periodic table—the transition metals 14. Chemical bonding and structure 15. Energetics/thermochemistry 16. Chemical kinetics 17. Equilibrium 18. Acids and bases 19. Redox processes 20. Organic chemistry 21. Measurement and analysis
	95 hours of teaching time	95 + 60 hours of teaching time
Option	Option C Energy	
	15 hours of teaching time	25 hours of teaching time
Prescribed and other practical activities	Experiments in the laboratory Virtual laboratories Laboratory reports	
	20 hours of teaching time	40 hours of teaching time
Internal Assessment	Individual investigation and written report (internally assessed)	
	10 hours of teaching time	
Group 4 project	The group 4 project is a collaborative activity where students from different group 4 subjects, within or between schools, work together. It allows for concepts and perceptions from across disciplines to be shared while appreciating the environmental, social and ethical implications of science and technology. It can be practically or theoretically based and aims to develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge. The emphasis is on interdisciplinary cooperation and the scientific processes.	
	10 hours of teaching time	

Tohoku International School:

A community of learners preparing for life in an evolving global society



Tohoku International School

Secondary School Course Syllabus

Assessments:

The Internal Assessment (IA) will be a written report based on the individual investigation the student will undertake in a laboratory. The other papers are exams written in May 2023.

	Standard Level	Higher Level
Paper 1	30 multiple-choice questions (Core) [30 marks] 0.75 hour 20% of final grade	40 multiple-choice questions (Core and AHL) [40 marks] 1 hour 20% of final grade
Paper 2	Short answer and extended response questions (Core) [50 marks] 1.25 hours 40% of final grade	Short answer and extended response questions (Core and AHL) [90 marks] 2.25 hours 36% of final grade
Paper 3	Data- and practical-based questions, plus short answer and extended response questions on the option C [35 marks] 1 hour 20% of final grade	Data- and practical-based questions, plus short answer and extended response questions on the option C [45 marks] 1.25 hours 24% of final grade
Internal Assessment	Individual investigation and write-up of 6 to 12 pages [24 marks] 10 hours or more 20% of final grade	Individual investigation and write-up of 6 to 12 pages [24 marks] 10 hours or more 20% of final grade

Resources:

Textbook: IB Chemistry, Course Book: Oxford IB Diploma Programme, 2014 Edition (SL & HL)
Lab manuals, Lab resources and equipment: for non-IA Prescribed Labs, Other Practical Work and IA
School Library that has a range of Chemistry books that are available for students to borrow
Specimen paper & Past Paper from International Baccalaureate Organisation (IBO)
Additional Resources: Virtual labs - www.chemcollective.org and some other virtual lab websites

Tohoku International School:

A community of learners preparing for life in an evolving global society