IBDP Chemistry SL/HL

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Should you wish to learn more about our course or to discuss your learner's progress, please reach out to the email above to schedule a time to meet.

Course Description and Units of Learning:

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills.

It is often called the central science as chemical principles underpin both the physical environment in which we live and all biological systems. Apart from being a subject worthy of study, chemistry is often a prerequisite for many other courses in higher education, such as medicine, biological science and environmental science.

Through studying a science subject student should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, the emphasis on a practical approach. In addition, through the overarching theme of the "Nature of Science" this knowledge and skills will be put into the context of way science and scientists work in the 21st century and the ethical debates and limitations of creative scientific endeavour.

The sciences are taught practically. Students have opportunities to design investigations, collect data, develop manipulative skills, analyze 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. Students develop the skills to work independently on their own design, but also collegiately, including collaboration with schools in different regions, to mirror the way in which scientific research is conducted in the wider community.

For a more detailed exploration of this course, the IB Subject Guide is available at this link for Standard Level and at this link for Higher Level.

Measurement and data processing
All measurement has a limit of precision and accuracy, and this must be taken into account when evaluating experimental results. Graphs are a visual representation of trends in data.

Stoichiometric relationships
Physical and chemical properties depend on the ways in which different atoms combine. The mole makes it possible to correlate the number of particles with the mass that can be measured. Mole ratios in chemical equations can be used to calculate reacting ratios by mass and gas volume.

Atomic structure
The mass of an atom is concentrated in its minute, positively charged nucleus. The electron configuration of an atom can be deduced from its atomic number.
Additional Higher Level: The quantized nature of energy transitions is related to the energy states of electrons in atoms and molecules.
Periodicity
Bonding and structure
The enthalpy changes from chemical reactions can be calculated from their effect on the temperature of their surroundings. In chemical transformations energy can neither be created nor destroyed (the first law of thermodynamics). Energy is absorbed when bonds are broken and is released when bonds are formed.
Additional Higher Level: The concept of the energy change in a single step reaction being equivalent to the summation of smaller steps can be applied to changes involving ionic compounds. A reaction is spontaneous if the overall transformation leads to an increase in total entropy (system plus surroundings). The direction of spontaneous change always increases the total entropy of the universe at the expense of energy available to do useful work. This is known as the second law of thermodynamics.
Chemical kinetics
The greater the probability that molecules will collide with sufficient energy and proper orientation, the higher the rate of reaction.
Additional Higher Level: Rate expressions can only be determined empirically and these limit possible reaction mechanisms. In particular cases, such as a linear chain of elementary reactions, no equilibria and only one significant activation barrier, the rate equation is equivalent to the slowest step of the reaction. The activation energy of a reaction can be determined from the effect of temperature on reaction rate.
Equilibrium
Many reactions are reversible. These reactions will reach a state of equilibrium when the rates of the forward and reverse reaction are equal. The position of equilibrium can be controlled by changing the conditions.
Additional Higher Level: The position of equilibrium can be quantified by the equilibrium law. The equilibrium constant for a particular reaction only depends on the temperature.
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This year we have begun planning and implementing units of study based on our Critical Learning Outcomes within the IB MYP and DP frameworks. Please see ManageBac for unit overviews as they are taught throughout the year.

Assessment in the Diploma Programme

Assessment is a key component of the learning process as it allows teachers to respond with targeted feedback to learners for continued growth and to revise their instruction to better meet the needs of their learners. In order to provide learners with the opportunity to reach critical learning outcomes and develop a range of approaches to learning skills, our IB Diploma teachers develop rigorous tasks that embrace a variety of strategies in line with desired learning outcomes and with each course’s internal and external assessments. Working backwards from these assessment components, teachers craft learning experiences which support each learner’s mastery of key content, concepts, and skills in every subject. Learners can expect to receive regular feedback on all three elements, with important culminating experiences such as IA drafts and mock examinations in the second

year. For culminating tasks, teachers and learners are guided by criteria provided at least one week prior to the due date. DP teachers also work to ensure that learners not only understand but engage in applying evaluation criteria to their own work as well as that of their peers. Core components such as Theory of Knowledge, CAS, and the Extended Essay support each learner's progress across the programme, as learners apply critical thinking, the design cycle, and research skills to each subject.

Families and learners at AISM can expect to receive regular reporting of their performance as they work towards mastery of critical learning outcomes.

Learning Management Systems

Across the Secondary School, we utilize ManageBac for sharing key activities and assessments, as a digital workspace, for communication with learners, and for reporting on learner performance to families. Some teachers may supplement the digital learning environment with Google Classroom, and you can expect an emailed invitation to sign up for regular updates from Google Classroom if so.

Homework

Any learning activity which is expected to take place outside of the classroom will appear as assignments and tasks on ManageBac. Homework is most often an extension of activities or projects either begun or included in the classroom, but may include common activities like reading, reinforcement of content or skills within a unit of study, or distributed practice activities, such as flashcards for example, to support learner recall of low-level content.

Reporting

As a rough guide, learners and families can expect an update on performance every few weeks. These updates, available in ManageBac, represent a check-in on learner performance toward mastering critical course objectives and learning outcomes, prior to each unit's culminating assessment.