

# International Baccalaureate - Program of Studies American International School of Rotterdam



# International Baccalaureate

Welcome to our Program of Studies for 2012/2013. This document contains descriptions of all High School International Baccalaureate (IB) course offerings, course entrance criteria, and graduation requirements.

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# 1. General Information - International Baccalaureate

## 1.1 The Program

The International Baccalaureate Organization's (IBO) Diploma Program is a rigorous two-year pre-university curriculum aimed at students aged 16 to 19. It leads to a qualification that is widely recognized by the world's leading universities. The Diploma Program encourages students to:

- Ask challenging questions;
- Learn how to learn;
- Develop a strong sense of self-identity and culture;
- Develop the ability to communicate with and understand people from other countries and cultures.

Over the course of the two-year program, students:

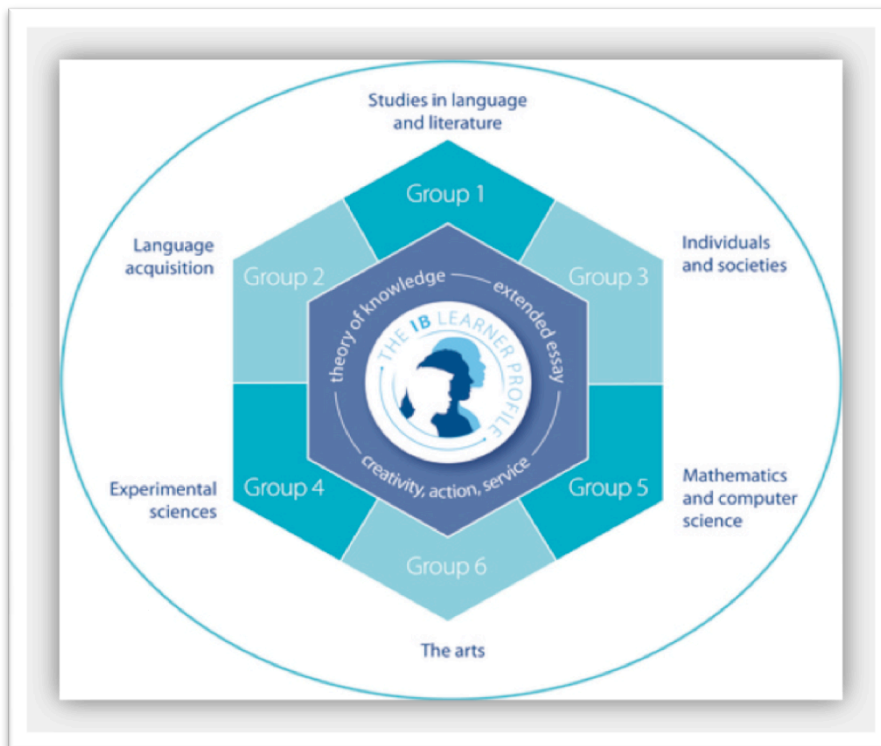
- Study six subjects chosen from the six subject groups; three of these subjects are chosen at Higher Level (HL) and three at Standard Level (SL).
- Complete an Extended Essay (EE)
- Follow a Theory of Knowledge course (TOK)
- Participate in Creativity, Action, Service (CAS).

As an IB World School, AISR offers an IB Curriculum of courses in its 11<sup>th</sup> and 12<sup>th</sup> grade years. All students have the opportunity to attempt the full IB diploma program. For further information on the IB program please visit [www.IBO.org](http://www.IBO.org).

## 1.2 THE IB CURRICULUM MODEL

The curriculum is modeled by a hexagon with six academic areas surrounding the three core requirements, which are the heart of the IB-Program (see figure 1).

For the Diploma, students take six courses. Three of these must be at Higher Level (HL) and three at Standard Level (SL). In exceptional circumstances, a student might be allowed to take 4 HL courses.



**Figure 1:** The IB-Curriculum Model

### **Diploma Candidates also work on the following three 'core requirements':**

All Diploma Programme students participate in the three course requirements that make up the core of the hexagon. Reflection on all these activities is a principle that lies at the heart of the thinking behind the Diploma Programme.

The Theory of Knowledge course encourages students to think about the nature of knowledge, to reflect on the process of learning in all the subjects they study as part of their Diploma Programme course, and to make connections across the academic areas. The Extended Essay, a substantial piece of writing of up to 4,000 words, enables students to investigate a topic of special interest that they have chosen themselves. It also encourages them to develop the skills of independent research that will be expected at university. Creativity, Action, Service involves students in experiential learning through a range of artistic, sporting, physical and service activities.

### 1.3 Diploma requirements

Although there are components for internal assessment at all levels and within all IB courses, IB is primarily an **externally assessed** program. Just as IB provides course content and structure, IB also grades the results at the end of the two-year program.

Students at AISR are graded alongside other students in IB schools all over the world. IB Examiners, not teachers, mark the examination scripts. The International Baccalaureate Organization awards Diplomas on the basis of the total points achieved in all examinations.

Each subject is graded on a 1 (lowest) to 7 (highest) scale. In order to receive a Diploma, a student must receive a minimum of 24 points. It is possible to receive 45 points (the maximum), but most candidates achieve between 26 and 33 points.

There are some exceptions to the '24 points' rule: these are known as 'Failing Conditions'.

The Diploma will not be awarded if the candidate's results contain any one of the following failing conditions:

- A grade 2 in any Higher Level subject
- A grade 3 in a Higher Level subject not compensated by a grade 5 or above in another Higher Level subject
- A grade 1 in any Standard Level subject
- Two grades 2 or below in any Standard Level subjects
- Four grades 3 or below
- Two grades 3 or below with a grade 2 or below at Standard Level
- An elementary grade (E) for Theory of Knowledge or the Extended Essay

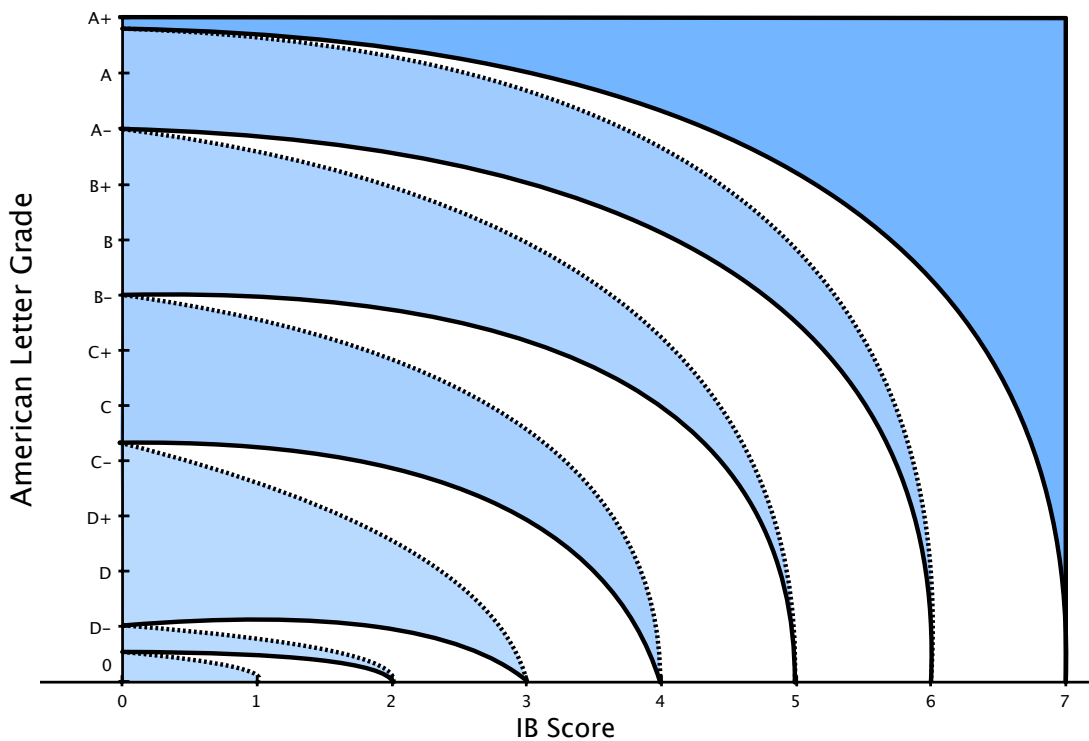
## 2. IB program at AISR

All students will graduate from AISR with a US High School diploma. The IB Diploma is awarded independently of the AISR High School Diploma and students receive their IB results in July.

## 2.1 IB and AISR Grading

IB does not publish conversion tables of the IB 1-7 scale to the US based A-F letter scale. There is no national standard in the US for an “A” or “A+” grade. In some schools it is based on a percentage score (90% or higher) where in other schools it is a conversion of a Grade Point Average (GPA). The IB grade scale is criterion-referenced, and grade boundaries are set annually at each examination session. IB’s summative grading is based on student performance in the work covered in a particular time period and uses IB subject-specific assessment criteria and grade descriptors.

IB does not “translate” 1 to 7 grades into other grade indicators. However, AISR uses the following graph when a conversion is necessary:



*Designed by Jeff Holcomb; January 2012*

A separate Mock report is published at the end of semester 1 of year 2. Mocks show what a student would get at a given moment in his/her school career if (s)he would sit the exam.

The grade scale indicates the letter grade and its corresponding percentage and grade point value. Courses carrying the IB descriptor will be weighted differently. IB higher-level courses receive an additional 0.5 points, and standard level courses receive an additional 0.25. The weighted GPA will be used for in-house or statistical purposes, such as Honor Roll.

GRADE	PERCENTAGE	POINTS
A+	97-100	4.3
A	93-96	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
D+	67-69	1.3
D	63-66	1.0
D-	60-62	0.7
F	0-59	0.0
I	Incomplete	
P/F	Pass/ Fail	

**Table 1:** IB grading scale

## 2.2 IB Results at AISR

Please view the IB-results May 2012 and averages compared to worldwide averages of 2010 - 2011 by students from the American International School of Rotterdam in the table below.

	<b>2010</b>	<b>2010</b>	<b>2011</b>	<b>2011</b>	<b>2012</b>
<b>Subject</b>	<b>AISR</b>	<b>Worldwide</b>	<b>AISR</b>	<b>Worldwide</b>	<b>AISR</b>
Eng A1 SL	4.75	4.97	5	5.06	5
Eng A1 HL	4	4.72	5.8	4.74	5
Hist SL	4	4.49			4
Hist HL	4	4.73	4.5	4.29	4.5
Bio SL	5	4.3	6	4.27	3.7
Physics SL	4	4.07	3	4.1	-
Physics HL	3.33	4.5		-	6
Math St.	4	4.75	4.5	4.66	4.7
Math SL	5.5	4.48	4	4.44	-
Math HL	2.75	4.38		-	6
Music SL			4	4.37	4
Vis.Arts SL	4	4.49		-	4.3
Vis.Arts HL	3.5	4.93	4.5	4.9	-
Average grade	4.83	4.83	5.33	4.66	4.83
Highest diploma	33		38		35

Average diploma	30	30	34	29.61	31
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### 2.3 Full Diploma or Diploma Program (DP) courses.

It is critical that each student and his/her parents invest sufficient time and energy to make an informed decision about how IB can best meet that student's needs. At AISR we encourage students to take the challenging (and rewarding) IB courses, but there is an expectation that students apply the required time and effort to achieve success. Students may attempt IB courses, however, the demands of the Diploma Program and specific courses should not be underestimated.

One reason students take the Diploma is in order to enhance their chances of college and university admission. An alternative to taking on the demands of the full Diploma program is to take DP Courses. Students who pass exams in individual DP Courses are awarded DP Courses Results in those subjects. Any IB class can be taken as an individual Course.

#### IB courses offered at AISR and online courses

The IB Diploma requires the study of six courses as well as completion of a Theory of Knowledge course, an Extended Essay and participation in the Creativity, Action, Service Programme. Students must choose one subject from each of groups 1 to 5, thus ensuring breadth of experience in languages, social studies, the experimental sciences and mathematics. The sixth subject may be an arts subject chosen from group 6, or the student may choose another subject from groups 1 to 5. Three courses are studied at Higher Level (HL) and three at Standard Level (SL). The selections may vary in the future depending on student interest and enrollment.

## 3. Course Descriptions

In this section a description on the IB-courses offered at AISR is provided. For a full overview of the courses offered, please see Appendix 1.

### 3.1 STUDIES IN LANGUAGE AND LITERATURE

#### 3.1.1 Language A: Language & Literature SL/HL Year 1 and 2

Grade: 11 - 12

Prerequisite: English 10 / Dutch 10 / Teacher recommendation

Credit: 1 per year



The aim of Language A: Language and Literature is to expand the focus of the traditional English/Dutch course by allowing students to explore not just a detailed study of literature, but also a discursive analysis of the ways that we use language in the world today, a variety of critical practices and a range of written productions. The course is divided into four parts, two of which focus on literature, and two of which focus on language. In the literature sections students will do a great deal of direct critical analysis of texts, but will also explore the contexts in which texts were written and learn to examine texts as products of their historical periods and geographical locations. In the language sections of the course students will examine the kinds of language we use in society, and specifically the constructed nature of the meanings generated by language. Topics in these sections might include language and power, language and the media, language and the internet, language and gender, language and identity, language and belief, translation, and so on. Students will also study basic linguistic theory and become familiar with its vocabulary.

Overall, this course aims to develop skills of textual analysis by combining the study of the formal structures of texts with an exploration of the way the use of formal elements and our understanding of their meaning is affected by reading practices that are culturally defined.

*Essential Text(s): Diploma Programme, Language A Language & Literature Guide, First examinations 2013; International Baccalaureate Organization, 2011.*

### **3.1.2 Self-taught Language A: Literature (SL)**

Students may elect to study a 'first' language as a 'self-taught' candidate (SL).

In this case, additional rules apply. AISR will advise the student/family on acquiring the necessary materials and inform them of IB requirements, however, it is the student's responsibility to obtain the necessary books and keep up with the workload. In addition, the family is responsible for securing and paying for the teacher and the necessary materials. Please contact the IB Coordinator in order to discuss the feasibility of this option.

Through the study of a wide range of literature, the language A: literature course encourages students to appreciate the artistry of literature and to develop an ability to reflect critically on their reading. Works are studied in their literary and cultural contexts, through close study of individual texts and passages, and by considering a range of critical approaches.

## **3.2 LANGUAGE B**

### **3.2.1 Spanish / French / Dutch B SL/HL**

Grade: 11 - 12

Prerequisite: Language 10/ Teacher recommendation

Credit: 1 per year

The IB Language B program is a foreign language-learning program designed for study at both Higher and Standard Levels by students with previous experience in learning the target language. The program meets the needs of IB students who have studied the target language for three to five years immediately prior to the beginning of their IB language course. However, a highly motivated and exceptional student, especially if he/she can arrange to study in a country where the language is spoken over the summer, may also be able to follow the Language B course at Standard Level.

The focus of this program is on language acquisition and on awareness of the cultures of the target language. The aim of the program is to give students the opportunity to reach a high degree of competence in the target language and to develop an appreciation and awareness of the cultures where the language is spoken. Authentic materials will be used to integrate the language skills of reading, writing, listening and speaking.

The continuous assessment of oral work is integrated into regular classroom activities. The teaching of an appropriate range of grammatical structures is also integrated as far as possible with the study of themes, texts and the acquisition of language skills. Authentic materials, such as television, films, documentaries, newspapers and magazines (as well as literary texts for HL), are used wherever possible and students are given maximum exposure to the target language.

*Essential text(s):*

*Diploma Programme, Language B Guide, First examinations 2013;* International Baccalaureate Organization, 2011.

### 3.2.2 Language Ab Initio

Spanish (online), Mandarin (online) SL

Grade: 11 – 12

Prerequisite: No previous study of the target language

Credit: 1 per year

**Mandarin ab initio** is a language acquisition course for students having little or no experience with Chinese languages. Learning a language is more than simply acquiring vocabulary and understanding some grammatical rules. It enables learners to interact in a new cultural context and function in a society different from their own. The Mandarin ab initio course develops students' functional literacy in the language as well as their appreciation for cultural diversity in general and for the cultural riches in Chinese-speaking communities in particular.

The language ab initio course aims to develop the receptive, productive and interactive skills to a high level of communicative competence. While providing a solid framework in terms of grammar and vocabulary, the Mandarin ab initio course is organized into a number of cultural and thematic topics related to three themes: individual and society, leisure and work, urban and rural environment in which grammatical structures and vocabulary can be practiced. The topics provide the students with opportunities to practice and explore the language as well as to develop intercultural understanding. Through the development of receptive, productive and interactive skills, students are enabled to communicate and interact appropriately in a defined range of everyday situations.

**Spanish ab initio** is a language acquisition course for students having little or no experience with the Spanish language. Learning a language is more than simply acquiring vocabulary and understanding some grammatical rules. It enables learners to interact in a new cultural context and function in a society different from their own. The Spanish ab initio course develops students' functional literacy in the language as well as their appreciation for cultural diversity in general and for the cultural riches in Spanish-speaking societies in particular.

The language ab initio course aims to develop the four primary language skills (listening, speaking, reading and writing) to a similar level of communicative competence. While providing a solid framework in terms of grammar and vocabulary, the Spanish ab initio course is organized into a number of cultural and thematic topics in which grammatical structures and vocabulary can be practiced. The topics provide the students with opportunities to practice and explore the language as well as to develop intercultural competence.

Through the development of receptive, productive and interactive skills, students are enabled to communicate and interact appropriately in a defined range of everyday situations.

*Adapted from the IB Language ab initio Guide © International Baccalaureate Organization.*

*Essential text(s):*

*Diploma Programme, Language Ab Initio Guide, First examinations 2013; International Baccalaureate Organization, 2011.*

### **3.3 INDIVIDUALS AND SOCIETIES**

#### **3.3.1 History (SL/HL)**

Grade: 11– 12

Prerequisite: 10<sup>th</sup> grade Modern World History or equivalent

Credit: 1 per year

The IB History course involves a study of various topics in depth from the 20<sup>th</sup> century. Students should become aware that historical accounts involve judgments based on qualitative evidence, and that these judgments might be revised. The student will be encouraged to reflect on the role of the historian and to examine whether the historian records history or creates it, and whether or not bias is desirable in the interpretation and recording of history. Thus, students will learn how to examine and understand documents, write analytical essays and compare and contrast global situations. The latter helps to foster respect and understanding of people and events in cultures different from their own.

**Paper 1 Document Exam:** Students study a prescribed topic: Peacemaking, peacekeeping- international relations 1918-1936

**Paper 2 Essay Exam on 20<sup>th</sup> Century World History:** Students must write two essays each chosen from a different topic. At AISR we address (to a varying degree of depth and breadth) the following topics:

- Causes Practices and Effects of War
- Origins and Development of Authoritarian and Single Party States
- The Cold War

**Paper 3 Regional Option:** Students who wish to take IB History at the Higher Level also

take a Paper 3 Essay exam in which they must answer three out of 25 questions on the history of at least 100 years of a particular region beginning with 1900. At AISR we teach the option, "Aspects of the History of Europe and the Middle East".

**Internal Assessment:** Both HL and SL students produce an historical investigation that is graded by the AISR teacher but moderated by the IB. The Internal Assessment is an integral part of the history course as it enables candidates to demonstrate the application of their skills and knowledge in history and to pursue their personal interests without the time constraints associated with written examinations.

*Essential text(s):*

*AISR has compiled an impressive collection of primary and secondary sources in a variety of formats. IB History students use a variety of sources for each unit within the two-year course.*

### **3.3.2 Business management (SL)**

Business and Management SL course is designed to develop students' understanding of business theory, as well as their ability to apply business principles, practices and skills. The application of tools and techniques of analysis facilitates an appreciation of complex business activities. The course considers the diverse range of business organisations and activities and the cultural and economic context in which business operates. Emphasis is placed on strategic decision-making and the day-to-day business functions of marketing, production, human resource management and finance. Links between the topics are central to the course, and this integration promotes a holistic overview of business activity.

The business and management course aims to help students understand the implications of business activity in a global market. It is designed to give students an international perspective on business and to promote their appreciation of cultural diversity in the business environment.

The ideals of international cooperation and responsible citizenship are at the heart of Diploma Programme business and management. The course encourages the appreciation of ethical concerns and issues of social responsibility in the global business environment. Students should be able to make sense of the forces and circumstances that drive and restrain change in an interdependent and multicultural world. The business and management course will contribute to students' development as critical and effective participants in local and world affairs.

### **3.3.3. Economics (SL/HL)**

The online economics course provides students with core knowledge of economics and incorporate elements of history, geography, psychology, sociology, political studies and other related fields of study.

Economics is a dynamic social science, forming part of the study of individuals and societies. The study of economics has many facets, and this is reflected in the broad scope of both courses. At its core, economics is concerned with the concept of scarcity and problems of resource allocation. Students will analyse how markets function and the ways in which market factors and government policies influence unemployment, inflation and economic growth. They will also consider economic theory in the contexts of microeconomics, macroeconomics, international and developmental economics. The scientific approach characterises the standard methodology of economics, featuring a progression from problem identification, through hypothesis formulation and testing, and arriving finally at a conclusion.

### **Differences between the Economics HL and SL courses**

The Higher Level course in economics differs from the Standard Level course in terms of the hours devoted to teaching (240 hours for HL compared to 150 hours for SL) and the extra depth and breadth of study required for HL through the inclusion of "extension topics".

These courses also differ with regard to the number of external assessment components (3 examination papers for HL, 2 examination papers for SL) and the weighting of the examination questions.

*Adapted from the IB Economics Guide © International Baccalaureate Organization*

### **3.3.4 Information Technology in a Global Society SL/HL**

This course, at both standard and higher levels, involves the study and evaluation of the impact of information technology (IT) on individuals and society. The course explores the advantages and disadvantages of "digital culture", and provides a framework for the student to make informed judgments and decisions about the use of IT within contemporary social contexts. ITGS offers students an opportunity for systematic study of a range of technological, social and ethical issues which fall outside the scope of any single discipline.

The course develops students' understanding of the capabilities of current and emerging IT systems and the impact of these systems on a range of stakeholders. Students are encouraged to apply their knowledge of existing IT systems to various scenarios and to make informed judgments about the effects of IT developments on these scenarios. Furthermore, students are required to use their knowledge of IT systems and practical IT skills to justify IT solutions for a specified client or end-user.

### **Differences between the ITGS HL and SL courses**

The Standard Level course in ITGS differs from the Higher Level course in terms of the hours devoted to teaching (150 hours for SL compared to 240 hours for HL) and the extra depth and breadth of study required for HL through the inclusion of “extension topics”.

HL students study two extension topics: “IT systems in organizations” and “robotics, artificial intelligence and expert systems”.

The HL course has an additional externally assessed component that comprises a previously seen case study based on a fictitious organization – this allows students to research various aspects of the subject, which may include new technical concepts and additional subject content, in greater depth.

*Adapted from the IB ITGS Guide © International Baccalaureate Organization*

### **3.3.5 Psychology SL**

Psychology is the systematic study of behavior and mental processes. Psychology has its roots in both the natural and social sciences, leading to a variety of research designs and applications, and providing a unique approach to understanding modern society.

IB psychology adopts an integrative approach - looking at the interaction between biological, cognitive and socio-cultural influences on human behavior. It enables students to achieve greater understanding of themselves and to appreciate the diversity of human behavior. The ethical concerns raised by the methodology and application of psychological research are key considerations.

The course takes a holistic approach, which fosters intercultural understanding and respect. In the core of the IB psychology course, the biological level of analysis demonstrates what all humans share, whereas the cognitive and socio-cultural levels of analysis reveal the immense diversity of influences that produce human behavior and mental processes. Cultural diversity is explored and students are encouraged to develop empathy for the feelings, needs and lives of others within and outside their own culture. This empathy contributes to an international understanding.

*Adapted from the IB Psychology Guide © International Baccalaureate Organization*

### 3.3.6 Philosophy SL

Philosophy deals with issues that are profound, usually difficult, and important for humanity. It is a systematic critical enquiry into profound, fascinating and challenging questions that people have asked since the beginning of time, and confronts new problems arising within contemporary society.

The emphasis of the IB philosophy course is very much on **doing** philosophy. Students develop their skills through the study of philosophical themes and the close reading of philosophical texts. They also learn to apply their philosophical knowledge and skills to real-life examples or situations and how non-philosophical material can be treated in a philosophical way. Philosophical questions are explored through an examination of themes and texts. Students learn through tools, such as critical and systematic thinking, careful analysis and evaluation, and construction of arguments. Students are challenged to develop their own philosophical voice and independence of thought.

IB Philosophy aims to bring the subject of philosophy alive, gaining a sense of its richness and practical value in daily life and expanding our appreciation of ourselves and the world around us. It teaches us not what to think, but how to think. By participating in the great philosophical debates, students will develop their skills of rigorous reasoning; by study, analysis and criticism of the great works of philosophy, ancient and modern, students will develop their capacity to make reasoned judgments for themselves.

## 3.4 IB EXPERIMENTAL SCIENCE COURSES

### 3.4.1 IB Biology SL/HL

Grade: 11 - 12

Prerequisite: Two complete years of science/Teacher recommendation

Credit: 1 per year

This course follows the International Baccalaureate Organization's Biology curriculum, and is offered at the Standard and Higher Levels. One of the experimental sciences within the IB program, Biology is the study of living organisms and systems. The course involves the study of a comprehensive set of biological themes and topics, as well as a practical scheme of work.

The material is similar to that found in introductory biology courses at the university level. It is a thorough investigation of biological concepts, including cells, the chemistry of life, genetics, ecology and evolution, human health and physiology, and plant science. Emphasis is placed on laboratory investigations and interpretations, with assessment given by the instructor and the IB Organization.



In Year two, the course is a continuation of the topics studied in IB Biology: Year One. The latter part of the second semester is devoted to reviewing for the IB Biology tests, taken in May.

*Essential text(s):*

Damon, A., McGonegal, R., Tosto, P., and Ward, W., *Standard Level/ Higher Level Biology Developed Specifically for the IB Diploma*; Heinemann International copyright, 2007.

*Biology Course Companion*, Oxford University Press, 2007.

### 3.4.2 Chemistry SL/HL

Grade: 11 - 12

Prerequisite: Two complete years of science/Teacher recommendation

Credit: 1 per year

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is 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 in its own right, chemistry is a prerequisite for many other courses in higher education, such as medicine, biological science and environmental science, and serves as useful preparation for employment.

The IB Chemistry course consists of core content, practical work and two “options.” HL students learn also additional HL (AHL) material. In the first year of the IB Chemistry course, the main topics are: The Atomic Structure, Periodicity, Quantitative Chemistry and Chemical Reactions. In the second year, the main topics are: Acids and Bases and Organic Chemistry. Students also complete two “option” subjects. During the second year students typically participate in the group 4 project, working with students from other science disciplines in a broad-based student-led investigation: this project develops collaboration and communication within a multi-disciplinary team.

At both HL and SL, laboratory work and Internal Assessments (IA) is given a high priority. Students design and conduct experiments throughout the two-year course. IA will make up 24% of the students’ IB final grade.

IB Chemistry topics are Quantitative Chemistry, Atomic Structure, Periodicity, Bonding, Energetics, Kinetics, Equilibrium, Acids and Bases, Oxidation and Reduction, Organic Chemistry, Measurement and Data Processing. Option topics are: Modern Analytical Chemistry, Human Biochemistry, Chemistry in Industry and Technology, Medicines and Drugs, Environmental Chemistry, Food Chemistry and Further Organic Chemistry.

*Essential text(s):*

Brown, C. and Ford, M., *Standard level chemistry, Developed especially for IB Diploma*, Pearson Bacculaureate, 2008.

Brown, C. and Ford, M., *Higher level chemistry, Developed especially for IB Diploma*, Pearson Bacculaureate, 2009.

### **3.4.3 Physics (SL/HL)**

Grade: 11 - 12

Prerequisite: C+ or Higher in Algebra II/Teacher recommendation

Credit: 1 per year

Physics is the study of the interactions of matter and energy. Our goal is to use a small number of basic concepts, equations and assumptions to describe our physical universe. Once the descriptions are in place, the principles involved can be used to make predictions about a broad range of natural phenomena, ranging from the very common to the enormously obscure.

The IB Physics course consists of core content, practical work and two options. Higher Level (HL) students learn additional HL (AHL) material. In the first year of the IB Physics course, the main topics are: Physics and Physical Measurement, Mechanics, Thermal Properties of Matter, Oscillations and Waves. During the first year, students typically participate in the group 4 project, working with students from other science disciplines in a broad-based student-led investigation. This ten-hour project develops collaboration and communication within a multi-disciplinary team.

In the second year, the topics learned are Atomic and Nuclear Physics, Energy, Power and Climate Change and Digital Technology. During the second year, students also complete two Option topics of the following: Sight and Wave Phenomena, Quantum Physics, Digital Technology and Communications, Relativity and Particle Physics, Astrophysics, and Biomedical Physics. Some of the Option topics are available only for SL or HL.

At both HL and SL, laboratory work and Internal Assessments (IA) is given a high priority. Students design and conduct experiments throughout the two-year course. IA will make up 24% of the students' IB final grade.

*Essential text(s):*

*SL: Tsokos, K. A., Physics for IB Diploma, Cambridge University Press, 2010*

*Hamper, C., Standard level physics, Developed especially for IB Diploma, Pearson Bacculaureate, 2009*

*HL: Tsokos, K. A., Physics for IB Diploma, Cambridge University Press, 2010*

*Hamper, C., Higher level physics, Developed especially for IB Diploma, Pearson Bacculaureate, 2009*

## 3.5 MATHEMATICS

### 3.5.1 Mathematical studies (SL)

Grade: 11 - 12

Prerequisite: Grade C or higher in Algebra I, Geometry. Passing grade in Algebra II also strongly recommended. Teacher recommendation

Credit: 1 per year

**Description:** *Is that really a fair die? How can you tell? What's up with Lewis Carroll and those strange word puzzles? How many cans would you need to build a pyramid that has 314 cans at its base. How is it possible that  $20+12+7.2+\dots$  never gets bigger than 50? What's better, to win the lottery and take all the money right away, or to take 51% now and have the rest invested?*

In IB Math Studies students will learn about these ideas and many others as they build on their algebraic and geometric skills from previous classes. While this is an “entry level” mathematics course for the IB, this course requires significant dedication both inside and outside of class as well as proficiency with the core concepts and skills of algebra and geometry. This course gives students a solid foundation for entry level University courses.

The syllabus includes number sets and algebra, logic, probability, functions, geometry and trigonometry, statistics, financial mathematics, and introductory differential calculus. Students will also be taught to use a graphing calculator to solve various types of problems.

*Essential text(s):*

Various texts will be used as resources for the topics studied. Some titles included are: L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM (College Preparatory Mathematics) Geometry Connections*, CPM Educational Program, 2007. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM Algebra 2 with Trigonometry*, CPM Educational Program, 2010. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM Pre-Calculus with Trigonometry*, CPM Educational Program, 2009. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM Statistics and Probability*, CPM Educational Program, 2010. S. Bedding, M. Coad, J. Forrest, B. Fussey, P. Waldmand de Tokman, *Mathematical Studies Course Companion*, Oxford, 2012.

### 3.5.2 Mathematics (SL)

Grade: 11 - 12

Prerequisite: Grade B or higher in Algebra II/Trigonometry and Geometry.

Teacher recommendation

Credit: 1 per year

*How much better is it to compound interest daily than monthly? What if a bank would compound interest continuously! Would that be a good deal. And what's up with this number  $e$ ? How does a graphing calculator find the slope of a tangent line, and why would I care? How can you figure out the value of the sine of an angle other than those special ones? Isn't there a faster way to add up the areas of all those little rectangles?*

Students in IB Math SL will address these questions and many more as they extend their knowledge of functions, trigonometry, statistics, probability, logarithms and matrices to include vectors and Calculus. Completion of this course meets the prerequisites for second semester Calculus at University level as well as prepares students for writing the IB Math SL examination.

This course will require significant amounts of nightly homework as well as assignments that extend over breaks. High levels of organization, motivation, persistence, and a positive attitude towards academic challenges are requirements for success in this course.

*Essential Text(s):*

Various texts will be used as resources for the topics studied. Some titles included are: Brown, *Calculus, An Applied Approach*, Larson & Edwards. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM (College Preparatory Mathematics) Pre-Calculus with Trigonometry*, CPM Educational Program, 2009. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM (College Preparatory Mathematics) Calculus*, CPM Educational Program, 2010. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM Statistics and Probability*, CPM Educational Program, 2010. L. Buchanan, J. Fensom, E. Kemp, P. la Rondie, J. Stevens, *Mathematics Standard Level Course Companion*, Oxford, 2012.

### **3.5.3 Mathematics (HL)**

Grade: 11 - 12

Prerequisite: Grade A- or higher in Geometry and Algebra II and IB Math SL1 or Pre-Calculus.

Teacher recommendation

Credit: 1 per year

Mathematics HL caters to students who are passionate about mathematics and who have had accelerated preparation prior to 11th grade.

IB Math HL builds on the concepts and skills developed in Pre-Calculus, exploring concepts in greater depth, as well as introducing Differential Equations. Hence, enrollment in IB Math HL at AISR is predicated on the successful completion of Pre-Calculus or equivalent. This is a very fast paced course, covers an extensive amount of material, and requires deep fluency with prerequisite skills. This is not a course for the faint at heart. Students need to be willing and able to put in whatever time it takes to solve daunting problems. IB Math HL? - you've got to really want it.

This course is significantly more than first year Calculus at University level and prepares students well for writing the IB Math HL examination.

*Essential Text(s): Various texts and other sources of information will be used as resources for the topics studied. Some titles included are:*

J. Stewart, *Calculus, Early Transcendentals*, Thomson Brooks/Cole, 6th edition. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM (College Preparatory Mathematics) Pre-Calculus with Trigonometry*, CPM Educational Program, 2009. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM (College Preparatory Mathematics) Calculus*, CPM Educational Program, 2010. L. Dietiker, J. Kysh, B. Hoey, T. Sallee, *CPM Statistics and Probability*, CPM Educational Program, 2010. J. Fensom, J. Harcet, L. Heinrichs, P. Maris Seiler, M. Torres Skoumal, *Mathematics Higher Level Course Companion*, Oxford, 2012.

## **3.6 THE ARTS**

### **3.6.1 Visual Arts (SL/HL)**

Grade: 11 - 12

Prerequisite: Teacher recommendation

Credit: 1 per year

The IB Art program covers two years of intensive and experimental work by students in the 11th and 12th grade. It is not purely practical but involves research into art and artists, and students must be prepared to work on art projects both in school and out, visiting galleries and gaining information and inspiration at all times and from all sources. An integral part of the IB Art course is the student Research Workbook. This is a journal kept by the student, into which regular entries are put, relating to research, ideas for artwork, sketches, notes et cetera. The Research Workbook is closely linked to (and often provides the background) for students' practical Work. The practical work can take the form of paintings, prints, drawings, collages, 3D constructions et cetera, and will form the basis of the student IB Art Exhibition that is held in April of the 2nd year.

The exhibition is the opportunity for the student to show what he or she has been working on for the previous two years. The IB Art examination takes the form of a private interview with the Art Teacher (who will ask the student about the work on display).

The students' investment workbooks should show evidence of:

- Their investigation and strategies for organizing its content;
- First hand responses to such content;
- Exploration of ideas both visually and in writing.

In order to do well at IB Art, a student must be motivated and have an inquiring mind. Technical ability is useful but is not a guarantee of success. The IB Art student should be open-minded, willing to work hard, interested in visual experimentation and has something to say.

The first year provides the student with the opportunity to explore different media and techniques. The course deliberately includes opportunities both for structured learning of the values of color, tone, form, design et cetera, and for wide-ranging personal research of a more experimental nature.

For the final year of the course it is anticipated that students follow their own individual artistic journey rather than respond to teacher-provided assignments. The emphasis is on personal interpretation and individual artistic statements.

### 3.6.2 Music (SL/HL)

Grade: 11 – 12  
Prerequisite: Teacher Recommendation  
Credit: 1 per year

**Description:** This course follows the IBO music program. There are three distinct pathways and each student needs to choose the one which is most appropriate to his/her musical background. The practical elements of IB music can be approached by a solo performance, group performance, or compositional pathway. All students will need to acquire and use an appropriate technical vocabulary to evidence their knowledge of music theory, and there are examined modules in world music and European Music. The HL level has to satisfy the entry stipulations of University music departments and Conservatoires alike, and a general competence in music theory, composition and performance, supported by a contextual understanding of music is a standard requirement in all higher education institutions.

*Essential Text:* Kamien, R., *Music: An Appreciation*. McGraw-Hill.

### **3.6.3 Film (online)**

Film is both a powerful communication medium and an art form. The DP film course aims to develop students' skills so they become adept both in interpreting others' work and in creating their own films.

Through the study and analysis of film texts and exercises in filmmaking, the DP film course explores film theory and history. The course will develop students' critical abilities, enabling them to appreciate the multiplicity of cultural and historical perspectives in film.

Students are encouraged to develop the professional and technical skills (including organisational skills) needed to express themselves creatively in film. The IB film course emphasises the importance of working individually and as a member of a group.

At the core of IB film is a concern with clarity of understanding, critical thinking, reflective analysis, effective involvement and imaginative synthesis achieved through practical engagement in the art and craft of film.

*Adapted from the IB Film Guide © International Baccalaureate Organization*

## **Appendix 1: Overview of IB-Courses**

### **LANGUAGE A LANGUAGE & LITERATURE (HL or SL):**

- English
- Dutch

### **LANGUAGE A LITERATURE (SL)**

- Self-taught Mother tongue (SL)

### **LANGUAGE B (HL or SL):**

- Spanish
- French
- Dutch

### **LANGUAGE AB INITIO (SL):**

#### *Online languages:*

- Ab Initio Mandarin (SL)
- Ab Initio Spanish (SL)

### **INDIVIDUALS & SOCIETY:**

- History (HL or SL)

#### *Online courses:*

- Business and Management (SL)
- Economics (HL or SL)
- Information Technology in a Global Society (HL or SL)
- Psychology (SL)
- Philosophy (SL)

### **EXPERIMENTAL SCIENCES**

- Biology (HL or SL)
- Chemistry (HL or SL)
- Physics (HL or SL)

### **MATHEMATICS**

- Mathematical Studies (SL)
- Mathematics (SL)
- Mathematics (HL)

### **THE ARTS**

- Visual Arts (HL or SL)
- Music (HL or SL)

#### *Online course:*

- Film (SL)